Annual Report for PVNGS Salt Deposition Monitoring Program

January - December 1991

Prepared for

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By

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Abstract

The PVNGS salt deposition and impact monitoring program began operation in May 1983. It is intended to meet the commitment to a monitoring program called for in the PVNGS Environmental Report, Construction Permit Stage and required by the operating licenses issued by the U.S. Nuclear Regulatory Commission (USNRC). This annual report describes the results of the sampling activities conducted during January through December 1991 and presents an analysis of these data. The media sampled include cooling tower basin water, deposited soluble and insoluble minerals (salt), soils, and vegetation (indigenous and cultivated).

Results for the various media sampled in the 1991 PVNGS drift monitoring program have been compared with corresponding preoperational values. There are clear indications of the effects of cooling tower emissions in the deposition samples from close-in monitoring sites. The 1990 results, as presented in last year's annual report, produced similar findings; 1991 PVNGS operations have not extended the range of influence of PVNGS cooling tower drift emissions beyond that observed in 1990.

The 1991 cooling tower operations at PVNGS had no significant effects on the offsite environment.

As a result of these findings and having satisfied the operating license commitment, the monitoring program was discontinued at the end of 1991.

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1 Introduction

HALLIBURTON NUS Environmental Corporation is conducting a salt deposition and impact monitoring program in the vicinity of the Palo Verde Nuclear Generating Station (PVNGS) for Arizona Public Service (APS). The objective of this monitoring program is to determine the environmental impact of salt drift emissions from the operation of the PVNGS round mechanical draft cooling towers.

This annual report presents the results of laboratory analyses of environmental samples collected from January through December 1991 and an assessment of their significance. The media sampled include agricultural crops, indigenous vegetation, soil, drift deposition, and cooling tower basin water. Suspended particulates collected by low-volume air filters are not reported in this annual report as in previous years based upon the conclusion (NUS, 1991a) that no correlation exists between suspended particulates and salt drift emissions from the PVNGS cooling towers. Also presented is a comparison of the 1991 data collected during plant operation with those collected during a preoperational period (1983 through 1985), as required by the PVNGS Units 1, 2, and 3 Environmental Protection Plans, Sections 4.2.2 and 5.4.1 (Appendix B of Facility Operating Licenses NPF-41, NPF-51, and NPF-74). The preoperational data, which exclude data for sites 16, 20, 80, 81, and 83 for 1985, are derived from a previous study (NUS, 1987a).

Specific assessments in this report include (1) the levels of airborne soluble and insoluble deposits, (2) the chemistry of surficial soils, (3) the salt concentrations in leaf tissue of agricultural crops and indigenous plants, and (4) the yield of cotton crops. Interrelationships observed between the measurements are also presented.

Additionally, this report provides a description, in the form of a climatological summary, of the area meteorology as measured at the PVNGS meteorological tower during the report period, and a modeling assessment of drift deposition during the period using actual cooling tower operating data and site meteorological data. Included as appendixes are tabulations of the plant operating data as well as the data bases upon which the assessments are

based. Meteorological data summaries for 1991 are presented in another report (HALLIBURTON NUS, 1992).

2 Monitoring Program Summary

The salt deposition and impact monitoring program began in May 1983. It is intended to meet the commitment to a monitoring program called for in the Environmental Report, Construction Permit Stage (ER-CP) (PVNGS, 1974, Section 6.2.5), and to satisfy the requirements of the PVNGS Units 1, 2, and 3 Environmental Protection Plans, Sections 4.2.2 and 5.4.1 (Appendix B of Facility Operating Licenses NPF-41, NPF-51, and NPF-74).

As described in Salt Deposition and Impact Monitoring Plan, Revision 5 (NUS, 1987c), the monitoring program was designed to (1) determine levels of air-borne salt deposition; (2) define physical and chemical properties of surficial soils; (3) estimate species richness and cover and measure the salt loading of agricultural crops and indigenous plant communities in the vicinity of PVNGS; and (4) estimate cotton crop yield. Several background locations that would not be affected by the operation of the PVNGS cooling towers were established as control sites. These sites were selected to give an indication of any long-term natural changes.

The following sections provide a brief summary of the sampling activities conducted during January through December 1991 that together constitute the PVNGS salt deposition and impact monitoring program. The media sampled included cooling tower basin water, deposited soluble and insoluble minerals (salt), soils, and vegetation (indigenous and cultivated). A description of salt emission and deposition modeling of the PVNGS area, which involved the use of actual plant operating and meteorological data for this period, is also presented in Section 2.2 of this report.

2.1 ONSITE METEOROLOGICAL MEASUREMENTS PROGRAM

The onsite meteorological measurements program at the site, which began on August 13, 1973, is described in the Environmental Report, Operating License Stage (ER-OL) (PVNGS, 1979). The measurement instruments are deployed at two heights (35 and 200 feet) on a guyed tower in the northwestern portion of the site.

Digital meteorological data have been recorded by the upgraded PVNGS meteorological system since October 1985. Before October 1985, such data were manually reduced from analog strip charts.

Monthly and annual statistics on all meteorological parameters collected at PVNGS were processed and compared with historical data. The results of these programs for calendar year 1991 are discussed in more detail in Section 3.

2.2 COOLING TOWER EMISSIONS AND MODELING

2.2.1 Cooling Tower Basin Water

Cooling tower basin water was sampled during all months in which cooling towers were operated in 1991. The chemical composition of the cooling tower basin water (and drift) was compared with that of deposits (dustfall jars) to identify any changes in salt composition associated with cooling tower operation. A summary of cooling tower operation for the period January through December 1991 is presented in Section 4.

The cooling tower basin water samples were analyzed for the major constituents identified in Table 3.6-1 of the ER-OL to determine the composition of the drift. These constituents include total dissolved solids (TDS), calcium, magnesium, potassium, chloride, sodium, nitrate, sulfate, and silica. Minor constituents were also quantitatively assessed to the extent feasible.

2.2.2 Emissions Modeling

The NUS FOG code was used to calculate the deposition of dissolved solids (salt) emitted as drift by the round mechanical draft cooling towers of PVNGS Units 1, 2, and 3. Input to the FOG code consisted of sequential hourly meteorological data for 1991, which were obtained from the PVNGS meteorological tower system, as well as daily plant operating data--i.e., the number of fans in operation; the circulating water flow rate; the heat release rate; the TDS concentration; and the drift rate and droplet size

distribution as determined from emission tests of the towers. These emission tests were performed in 1983 (ESC, 1983) and again in 1990 (ESC, 1990).

2.3 SALT DEPOSITION MEASUREMENTS

The measurement of salt deposition was accomplished through the collection of drift deposition samples, which were then analyzed for dissolved mineral content and suspended solids. Sampling was accomplished by placing, at selected monitoring locations, pairs of open jars containing demineralized water. The jars were 6 inches in diameter and 18 inches deep. The 18-inch-deep jar recommended by the American Society for Testing and Materials (ASTM) was used for drift collection. This jar is regarded as the most suitable vessel for sampling in a desert environment; it requires less frequent checking of the water level than other, shallower jars. Two jars were placed at each sampling location to provide for an estimate of sampling precision.

The jars were elevated approximately 3 feet above the ground surface on stands, and a bird ring was placed around the edge of each jar to prevent birds from perching and contaminating the sample. This height was used instead of the minimum height of 8 feet recommended by the ASTM (1970) to permit the collection of drift deposition that occurs at typical plant crown height. A chemically inert 1- to 2-millimeter conical screen was suspended above the maximum water level in the jars to keep out potential contaminants such as those attributable to insects and birds. At least 1 inch of water was maintained in the jars to prevent collected drift from being blown out.

The monthly sampling procedure followed the ASTM method for the collection of dustfall. At the end of each month the jars were collected and a clean set of jars installed. The collected sample from each jar was first transferred to a graduated cylinder. The jar was rinsed to extract any residue, and the rinsate was transferred to the cylinder. The sample was then transferred to a shipping bottle, labeled, and sent to a laboratory for analysis.

Figure 2-1 shows the locations of the 44 sites where drift deposition samples were collected. In addition to the 44 sites committed in the Monitoring

Plan, APS established 4 interim drift-deposition-only onsite sampling locations in May 1985. These locations, sites 80-83 (not shown in Figure 2-1), were established close to the cooling towers to provide unambiguous indications of drift deposition above the background level. Table 2-1 lists the approximate distances (miles) and directions (sectors) from the centroid of the PVNGS Unit 2 cooling tower array of all 48 monitoring sites.

The laboratory analyzed the collected drift deposition samples for total suspended solids and for the most significant dissolved components of the cooling tower drift as identified in Table 3.6-1 of the ER-OL.

2.4 SOILS MEASUREMENTS

At each of the 44 monitoring locations depicted in Figure 2-1, soil samples were collected in April (following the 1991 wet season) and in July (following the dry season). Collections were also made at all 13 agricultural sites after cotton defoliation (November). The samples were drawn from the upper and lower fractions of five cores on each of two transects. Sampling was in accordance with the methods described by the U.S. Department of Energy's Environmental Measurements Laboratory Procedures Manual (DOE, no date). A soil auger was used to collect 8-centimeter-diameter core samples to depths of 30 centimeters, which were divided into upper (0- to 15-centimeter) and lower (15- to 30-centimeter) segments. The upper and lower segments for each transect were separately combined to form four composites, one for each depth segment for each of the two transects. From each composite two samples were taken and labeled. The labeled samples were then taken to the analytical laboratory, where one composite sample was analyzed and the other retained in storage.

Soil samples were each analyzed for soluble sodium, calcium, potassium, magnesium, sulfate, nitrate, chloride, fluoride, carbonate, bicarbonate, ammonium, phosphate, boron, exchangeable sodium, exchangeable calcium, exchangeable potassium, exchangeable magnesium, pH, and electrical conductivity.

2.5 VEGETATION MEASUREMENTS

2.5.1 Agricultural Crops

At 5 of the 13 agricultural monitoring sites (Figure 2-2), agricultural crops were sampled twice each growing season (July and August) before defoliation (or harvest) for the estimation of leaf tissue salt loading. (Eight of the sites--7, 11, 24, 25, 28, 31, 32, and 45--were fallow during the 1991 growing season.) Cotton yield was estimated by collecting and weighing the seed and fiber (boll) from randomly selected cotton plots. This sampling occurred during the month of October 1991.

Agricultural crop samples were sent to a laboratory for chemical analysis. The samples were oven-dried at 70°C for 24 hours, dry-weighed, ground in a blender, and stored in Kraft paper bags. The dried samples were analyzed for total sodium, calcium, potassium, magnesium, phosphate, soluble sulfate, nitrate, chloride, and fluoride.

2.5.2 Indigenous Vegetation

Representative native plant communities, which have been identified and monitored since 1976 to determine baseline conditions, were sampled semi-annually (March and October). The locations of the eight indigenous vegetation sites are depicted in Figure 2-2.

Two indigenous plant communities, one dominated by creosote bush and the other by salt bush, occur on and in the vicinity of PVNGS. Associated with these are mesquite and several species of cacti. The indigenous vegetative sampling conducted within each of the existing sites included measurement of species richness and relative cover and measurement of the salt concentration in leaf tissues of the dominant flora (other than cacti).

After collection, native vegetation samples were sent to a laboratory for chemical analysis. These samples were oven-dried at 70°C for 24 hours, dry-weighed, ground, and stored in Kraft paper bags. The dried samples were

analyzed for total sodium, phosphate, calcium, potassium, magnesium, soluble sulfate, nitrate, chloride, and fluoride.

2.5.3 Aerial Photography/Remote Sensing

Indigenous vegetation and agricultural crops were monitored by aerial (color infrared) photography. The principal crops grown in a 5-mile radius of PVNGS were photographed near the time of peak productivity (September).

Table 2-1. Distance and direction of 48 drift deposition monitoring sites from centroid of PVNGS Unit 2 cooling towers (sheet 1 of 2)

Site	Distance (miles)	Direction (sector)	Site type	Onsite vs. offsite	Sample
1	1.3	NE	Native	Onsite	DF, S, NV
2	1.5	NE	Native	Onsite	DF, S, NV
3	0.6	NNW	Native	Onsite	DF, S, NV
4	2.2	SSE	Native	Onsite	DF, S, NV
5	2.0	S	Native	Onsite	DF, S
6	1.8	S	Native	Onsite	DF, S, NV
7	5.1	ENE	Agricultural	Offsite	DF, S, AG
8	2.1	N	Native	Offsite	DF, S
9	1.8	NNE	Native	Offsite	DF, S
10	1.6	NE	Native	Onsite	DF, S
11	2.0	NW	Agricultural	Offsite	DF, S, AG
12	4.8	NW	Agricultural	Offsite	DF, S, AG
13	3.2	NNW	Agricultural	Offsite	DF, S, AG
14	1.0	NE	Native	Onsite	DF, S
15	5.0	N	Native	Offsite	DF, S
16	0.6	NNE	Native	Onsite	DF, S
17	4.0	W	Native	Offsite	DF, S
18	2.8	W	Native	Offsite	DF, S
19	2.3	W	Native	Offsite	DF, S
20	0.4	WSW	Native	Onsite	DF, S
21	3.1	E	Native	Offsite	DF, S
22	4.8	E	Native	Offsite	DF, S
23	2.3	SW	Agricultural	Offsite	DF, S, AG
24	4.0	N	Agricultural	Offsite	DF, S, AG
25	19.0	WNW	Agricultural control	Offsite	DF, S, AG
26	5.0	NE	Native	Offsite	DF, S
27	2.3	S	Native	Onsite	DF, S
28	3.7	SW	Agricultural	Offsite	DF, S, AG
30	3.9	SSW	Agricultural	Offsite	DF, S, AG
31	3.5	SSE	Agricultural	Offsite	DF, S, AG

Table 2-1. Distance and direction of 48 drift deposition monitoring sites from centroid of PVNGS Unit 2 cooling towers (sheet 2 of 2)

Site	Distance (miles)	Direction (sector)	Site type	Onsite vs. offsite	Sample
32	3.9	SE	Agricultural	Offsite	DF, S, AG
33	5.3	SE	Native	Offsite	DF, S
34	6.7	NE	Native	Offsite	DF, S
35	9.9	NE	Native	Offsite	DF, S
36	12.8	NE	Native	Offsite	DF, S
37	15.0	NE	Native	Offsite	DF, S
38	10.0	SW	Native	Offsite	DF, S
39	11.5	SW	Native	Offsite	DF, S
40	18.2	WNW	Native control	Offsite	DF, S, NV
41	2.8	NE	Native	Offsite	DF, S
42	16.6	SSE	Native control	Offsite	DF, S, NV
43	15.0	SSE	Agricultural control	Offsite	DF, S, AG
44	6.6	NW	Native	Offsite	DF, S, NV
45	5.1	SW	Agricultural	Offsite	DF, S, AG
80	0.5	NE	Supplemental	Onsite	DF
81	0.2	NNW	Supplemental	Onsite	DF
82	0.5	SSW	Supplemental	Onsite	DF
83	0.3	ESE	Supplemental	Onsite	DF

Key: DF, dustfall; S, soils; NV, native vegetation; AG, agricultural crops.

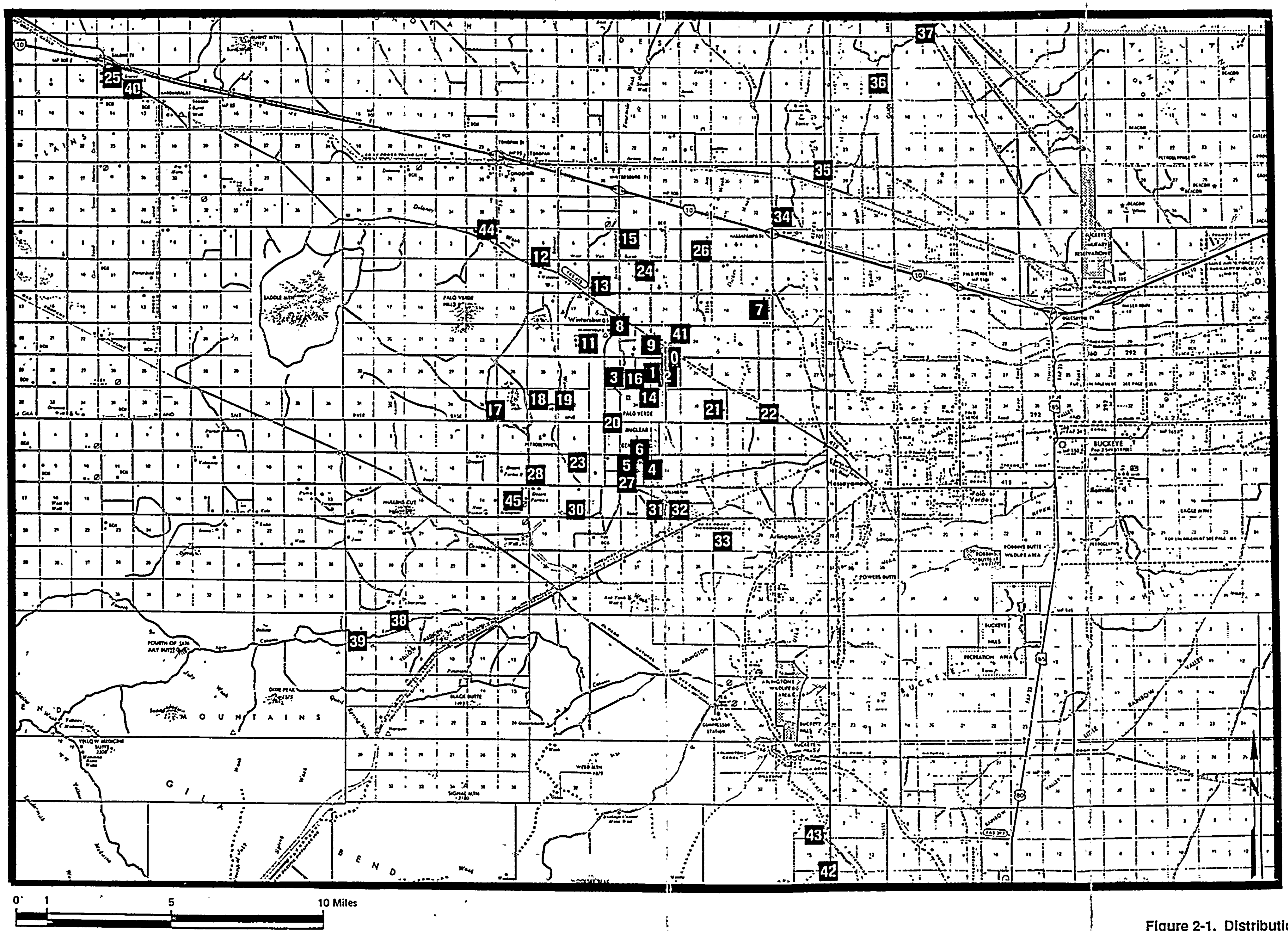

Figure 2-1. Distribution of PVNGS drift deposition and soil sampling locations

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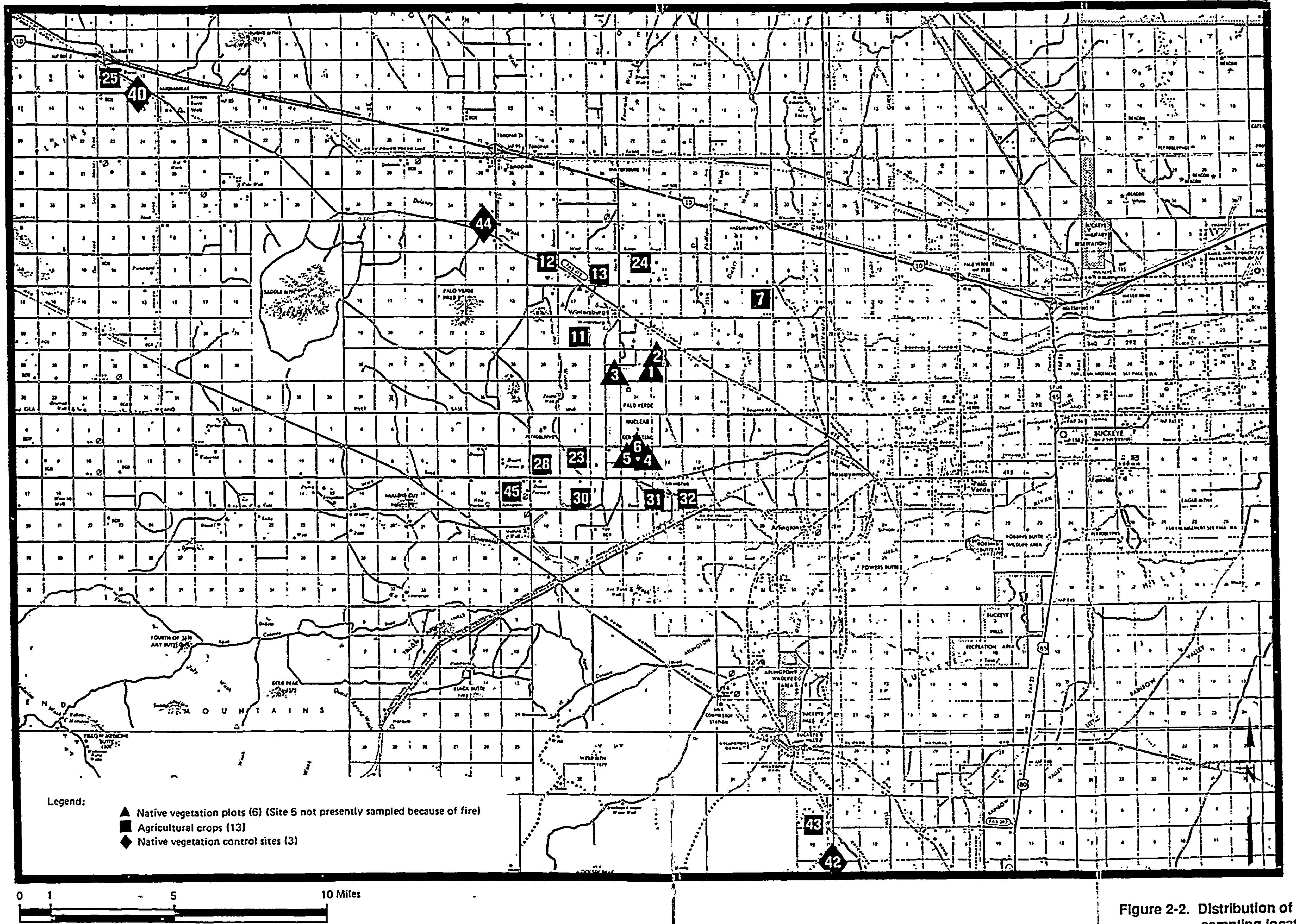

Figure 2-2. Distribution of PVNGS vegetation sampling locations

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3 Climatological Summary

3.1 GENERAL CLIMATOLOGY

The PVNGS site is in southwestern Arizona approximately 50 miles west-southwest of the Phoenix National Weather Service Station (NWS Phoenix) at Sky Harbor International Airport. The site area is part of the Inter-Mountain Plateau Climatic Zone, the driest region of the United States (Baldwin, 1973). This large, arid region is typified by abundant sunshine, infrequent precipitation, low relative humidities, large diurnal temperature ranges, moderate wind speeds, and an occasional intense summer thunderstorm (NOAA, 1984). The summers are hot and the winters are mild. A more detailed description of the climatology of the PVNGS site is provided in the ER-OL (PVNGS, 1979, Section 2.3).

3.2 METEOROLOGICAL SUMMARY

Presented in Table 3-1 are monthly averages of temperature, dew point, wind speed, and monthly totals of precipitation for the PVNGS site and NWS Phoenix for 1991. The PVNGS data on temperature and dew point compare reasonably well with those for NWS Phoenix. They show, for example, that NWS Phoenix in 1991 was about 4°F warmer than the PVNGS site and that this difference is partly due to differences in measurement height. They also indicate, however, that in 1991 NWS Phoenix received slightly less precipitation than PVNGS. Table 3-2 lists the number of days each month in 1991 when precipitation was recorded at the PVNGS site and NWS Phoenix. Most of the precipitation occurred in the summer, fall, and winter; dry periods occurred primarily in the spring.

Comparisons of 1991 data and long-term averages for both PVNGS and NWS Phoenix are presented in Section 9.1.

Monthly, quarterly, and annual wind roses for the 35- and 200-foot levels of the meteorological tower at PVNGS for 1991 are presented as Figures 3-1 through 3-7. As seen in Figure 3-7, annual average wind directions for both levels are similar in that they reflect peak frequencies for winds from the southwest. However, a secondary peak from the north is evident only for the

35-foot level. This secondary peak is a reflection of the nighttime cold air drainage flow from the higher terrain just north of the PVNGS site. The highest average wind speeds at the 35-foot level are for winds from the east. The highest average wind speeds at the 200-foot level are for winds from the southwest, but there is a secondary peak for winds from the east. The frequency of calm winds is 0.05 percent for the 35- and 200-foot levels, for the year. The quarterly wind roses (Figures 3-5 and 3-6) reflect a similarity between the first and fourth quarters with respect to the drainage effect at the 35-foot level. Lighter wind speeds, lower temperatures, and a high occurrence of stable conditions produce a higher frequency of nighttime cold air drainage flow during these quarters. The second and third quarter wind roses for both the 35- and 200-foot levels show peak frequencies for winds from the southwest.

Table 3-3 shows the occurrence of wind gusts in excess of 50 miles per hour at the 35- and 200-foot levels at PVNGS for 1991. Most of the occurrences were in the spring months and were associated with large low pressure systems in the southwest.

Table 3-4 presents monthly distributions of atmospheric stability classes for PVNGS for 1991 based on the delta T (i.e., the difference between the temperature at 200 feet and that at 35 feet). The distributions show that stable classes (E, F, and G) dominated throughout the year. The unstable classes (A, B, and C) have a higher frequency of occurrence in the spring and summer months. Analyses of PVNGS meteorological data since 1974 confirm that this is a normal pattern for the PVNGS site area. A more detailed description of the meteorological conditions at PVNGS during 1991 is presented in PVNGS Meteorological Data Summaries, January 1, 1991 - December 31, 1991.

3.3 METEOROLOGICAL DATA RECOVERY

PVNGS meteorological data recovery for 1991 is indicated in Table 3-5. Annual data recovery for each parameter was greater than 99 percent, and at no time did monthly data recovery for any parameter drop below 97 percent. These high recovery rates are attributable in part to the upgraded

meteorological system installed at PVNGS in mid-October 1985 and in part to limited hours of power outages.

Table 3-1. Monthly averages of meteorological data for PVNGS and NWS Phoenix, 1991

Month	Temperature (°F)		Dew point (°F)		Precipitation(in.)*		Wind speed (mph)	
	PVNGS†	NWS Phoenix‡	PVNGS†	NWS Phoenix‡	PVNGS	NWS Phoenix	PVNGS†	NWS Phoenix†
January	52	56	30	33	2.23	0.63	4.8	4.0
February	62	66	25	31	0.41	0.56	6.1	5.6
March	57	60	34	34	1.96	2.05	7.4	7.1
April	68	72	25	29	0.00	0.00	7.2	7.0
May	76	80	26	31	0.00	0.00	8.1	7.4
June	85	88	29	37	0.00	T	6.7	5.8
July	92	95	48	51	0.07	0.14	8.0	6.9
August	91	95	53	56	1.75	0.12	7.1	6.9
September	84	89	53	54	0.47	0.81	6.4	6.4
October	76	80	36	42	0.20	1.16	6.0	5.6
November	59	64	31	35	0.83	1.25	5.6	5.3
December	54	57	39	41	0.58	1.63	5.0	4.8
Annual	71	75	36	40	8.50	8.35	6.5	6.1

*Annual precipitation is sum of monthly totals.

†Based on measurement at 33 feet.

‡Based on measurement at 5 feet.

T = Trace amount

Table 3-2. Number of days with precipitation events of ≥0.01 inch at PVNGS and NWS Phoenix, 1991

Month	PVNGS	NWS Phoenix
January	5	3
February	3	3
March	8	7
April	0	0
May	0	0
June	0	0
July	2	2
August	4	5
September	2	3
October	1	2
November	6	6
December	5	6
Average (month)	3.0	3.1

Table 3-3. Occurrences of wind gusts in excess of 50 miles per hour at PVNGS, 1991

Date	Hour ending	Occurrences during hour	Wind speed level (ft)	Probable cause
2/6	2000	1	200	Gust front *
2/7	0200	1	200	Low Pressure
3/1	1500	1	35	Low Pressure
3/1	1600	1	35	Low Pressure
3/1	1400	9	200	Low Pressure
3/1	1500	>10	200	Low Pressure
3/1	1600	7	200	Low Pressure
3/1	1700	1	200	Low Pressure
3/1	1800	3	200	Low Pressure
3/19	0700	1	200	Thunderstorm
3/19	0800	3	200	Thunderstorm
3/26	1300	1	35	Low Pressure
3/26	1200	2	200	Low Pressure
3/26	1300	3	200	Low Pressure
3/26	1400	6	200	Low Pressure
4/27	1700	1	200	Low Pressure
7/4	2200	1	200	Gust front *
8/22	2200	4	200	Gust front *
8/24	2000	7	35	Thunderstorm
8/24	2000	>10	200	Thunderstorm
9/3	2300	1	200	Gust front *

*Large outflow winds produced by intense thunderstorms within 75 miles of the PVNGS site, but not occurring at the site.

Table 3-4. Monthly percent frequency distributions of stability classes based on delta T for PVNGS, 1991

Month	Stability category A	B	C	D	E	F	G
January	0.40	0.40	1.75	26.75	15.99	19.62	35.08
February	0.45	1.64	2.68	29.32	15.48	11.16	39.29
March	1.34	3.36	4.57	29.70	27.96	17.88	15.19
April	8.75	7.78	9.03	18.75	14.72	14.86	26.11
May	16.67	9.54	7.66	15.19	19.89	14.11	16.94
June	10.28	9.31	10.14	19.03	15.69	19.86	15.69
July	13.44	12.37	9.41	20.03	24.19	14.78	5.78
August	6.72	7.80	11.16	23.12	26.08	15.99	9.14
September	2.36	5.83	11.25	21.39	22.22	15.28	21.67
October	1.21	4.44	9.54	21.64	13.71	16.26	33.20
November	0.28	1.11	4.72	26.94	15.56	12.64	38.75
December	0.00	0.27	2.02	25.27	21.37	18.01	33.06
Annual	5.19	5.34	7.01	23.06	19.46	15.91	24.02

Notes:

1. Delta T is defined as difference between temperatures at 200- and 35-foot levels of meteorological tower.
2. Averages are based on joint recovery of stability and 35-foot wind data.

Table 3-5. Percentages of meteorological data recovery for PVNGS, 1991

Month	35-ft wind Speed	35-ft wind Direction	200-ft wind Speed	200-ft wind Direction	ΔT*	Joint (ΔT and 35-ft Wind data)	35-ft Dew point	35-ft Temperature	Precipitation
January	100	100	100	100	100	100	99	100	100
February	100	100	100	100	100	100	97	100	100
March	100	100	100	100	100	100	97	100	100
April	100	100	100	100	100	100	98	100	100
May	100	100	100	100	100	100	100	100	100
June	100	100	100	100	100	100	100	100	100
July	100	100	100	100	100	100	100	100	100
August	100	100	100	100	100	100	100	100	100
September	100	100	100	100	100	100	100	100	100
October	100	100	100	100	100	100	100	100	100
November	100	100	100	100	100	100	100	100	100
December	100	100	100	100	100	100	100	100	100
Annual	100	100	100	100	100	100	99	100	100

*Difference between temperatures at 200- and 35-foot levels of meteorological tower.

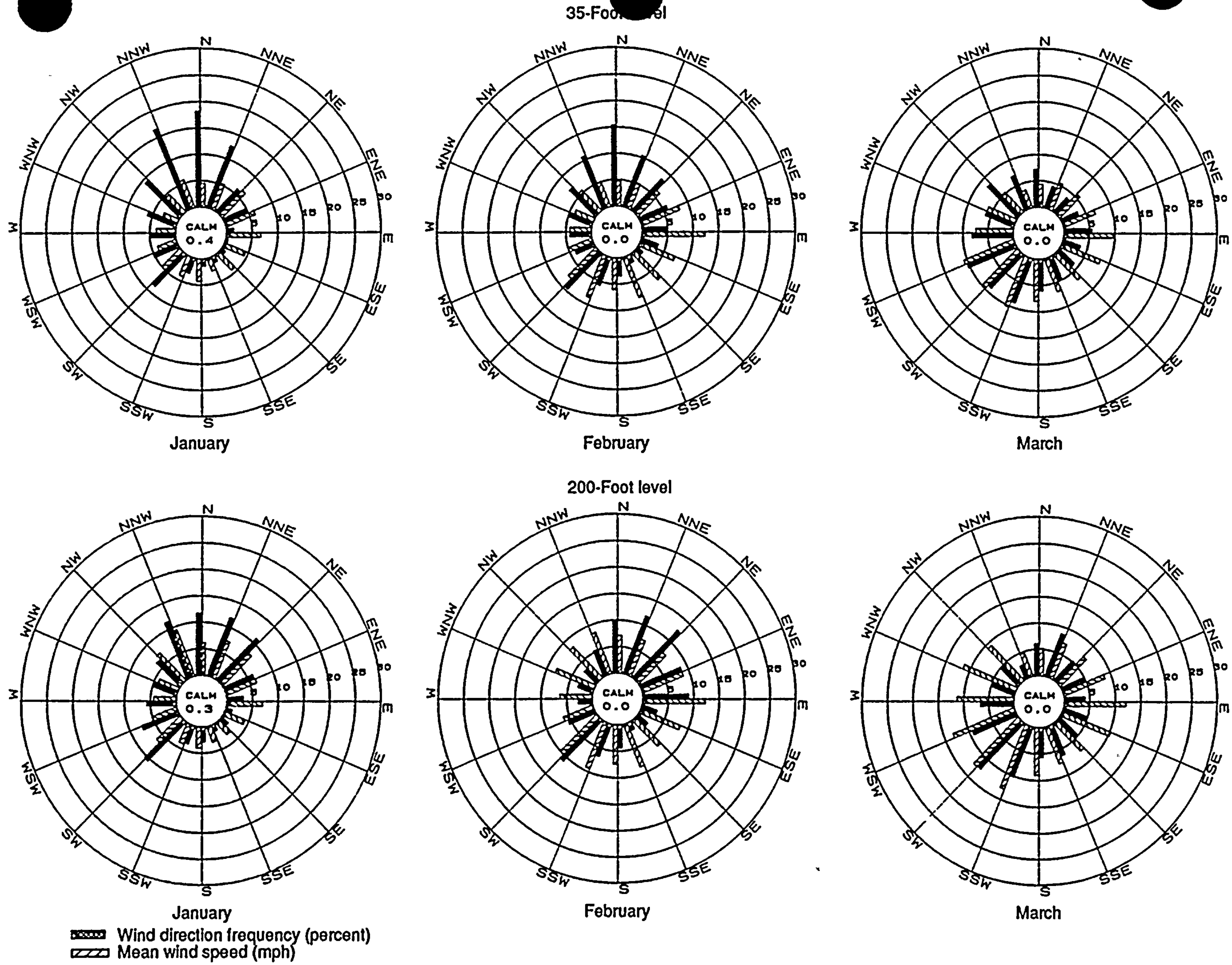

Figure 3-1. Gross wind roses for PVNGS, January, February, and March 1991

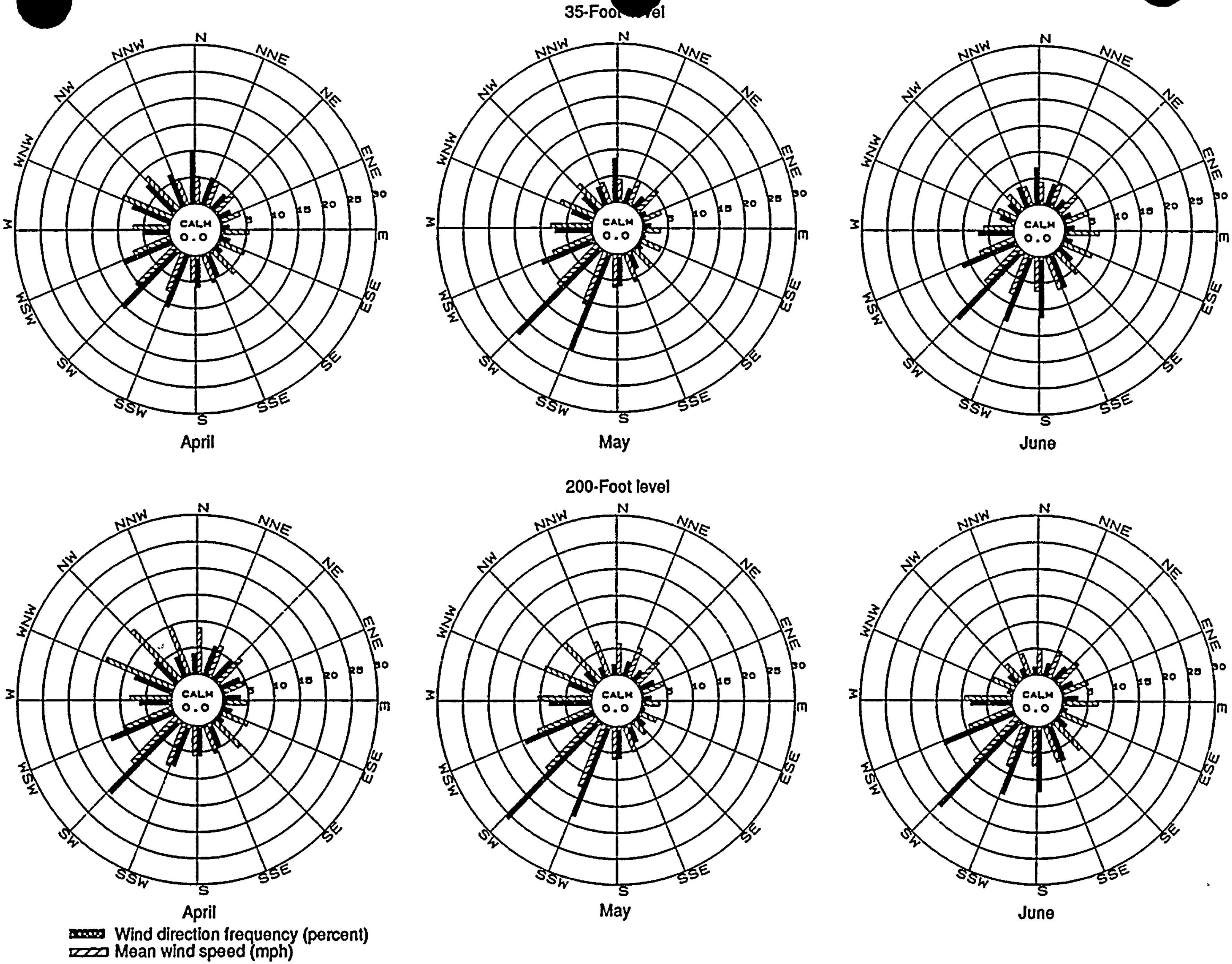

Figure 3-2. Gross wind roses for PVNGS, April, May, and June 1991

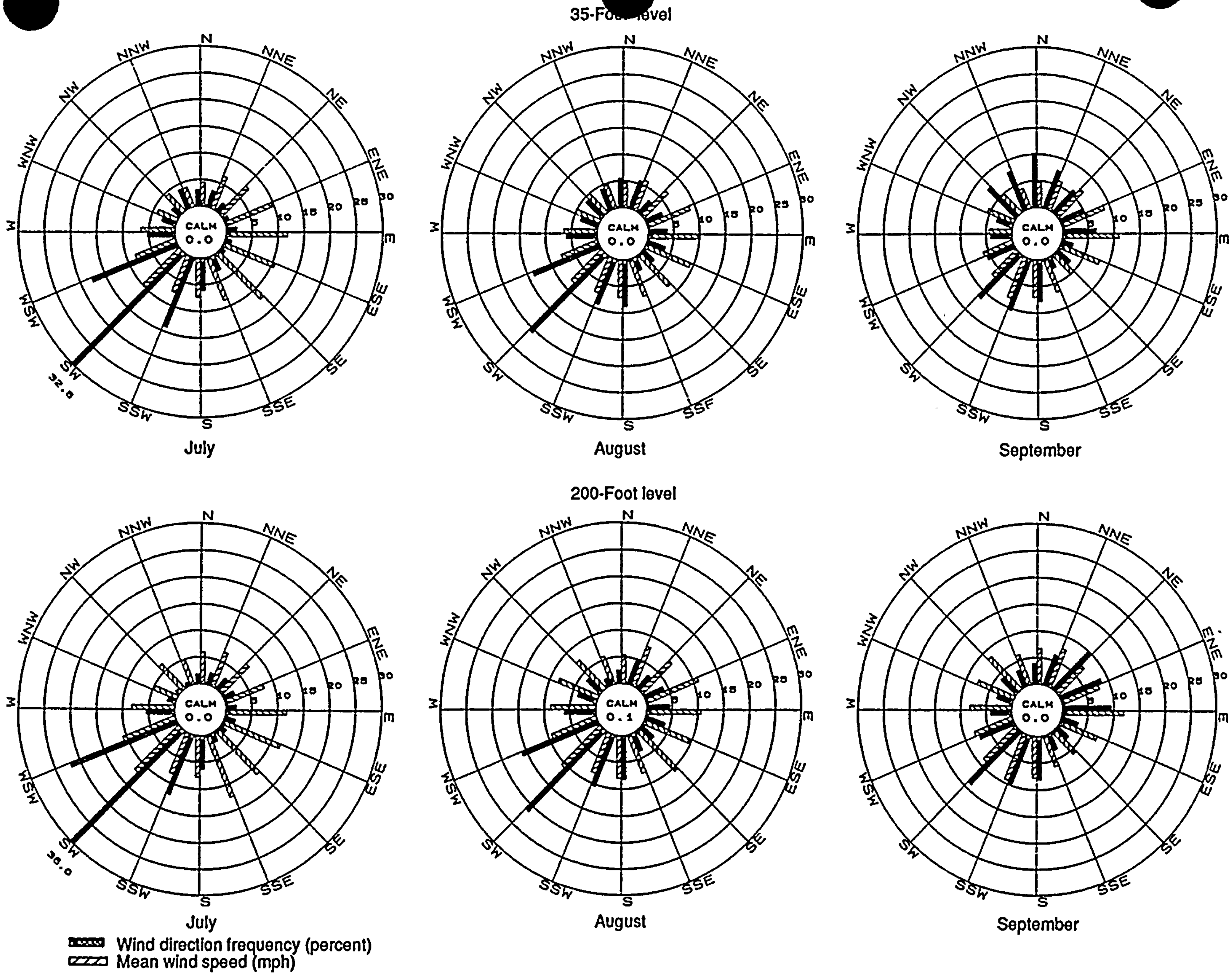

Figure 3-3. Gross wind roses for PVNGS, July, August, and September 1991

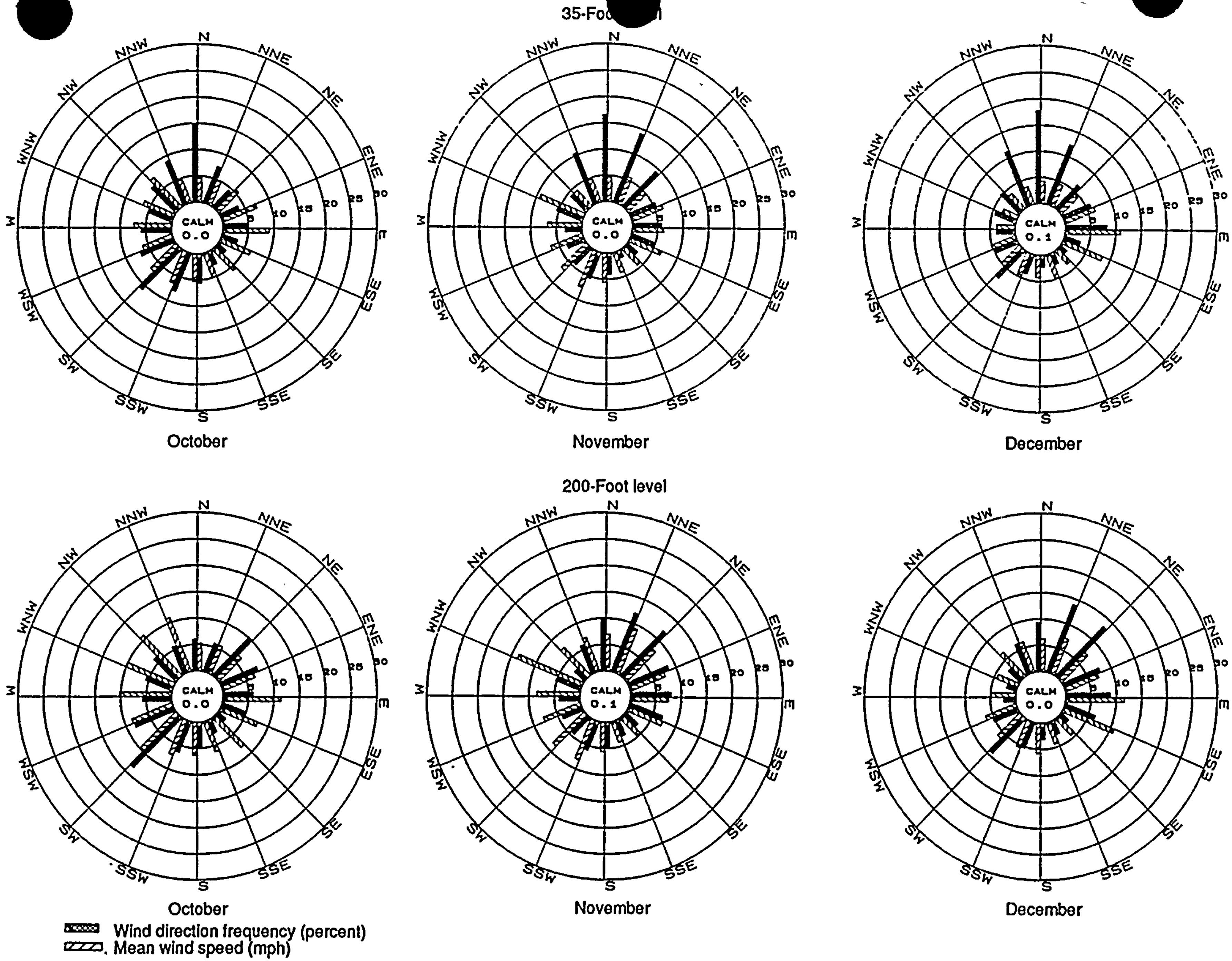

Figure 3-4. Gross wind roses for PVNGS, October, November, and December 1991

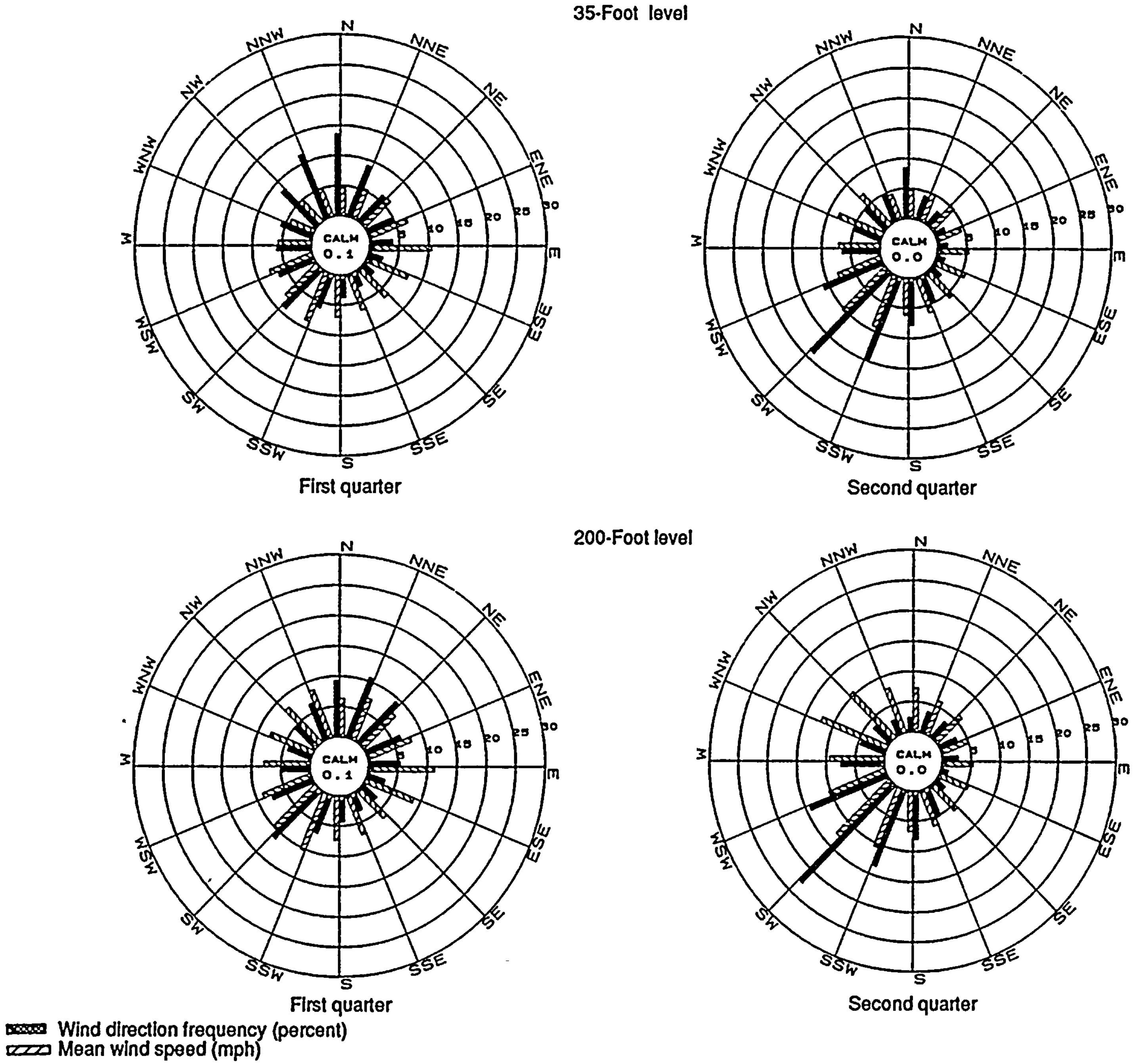

Figure 3-5. Gross wind roses for PVNGS, first and second quarters 1991

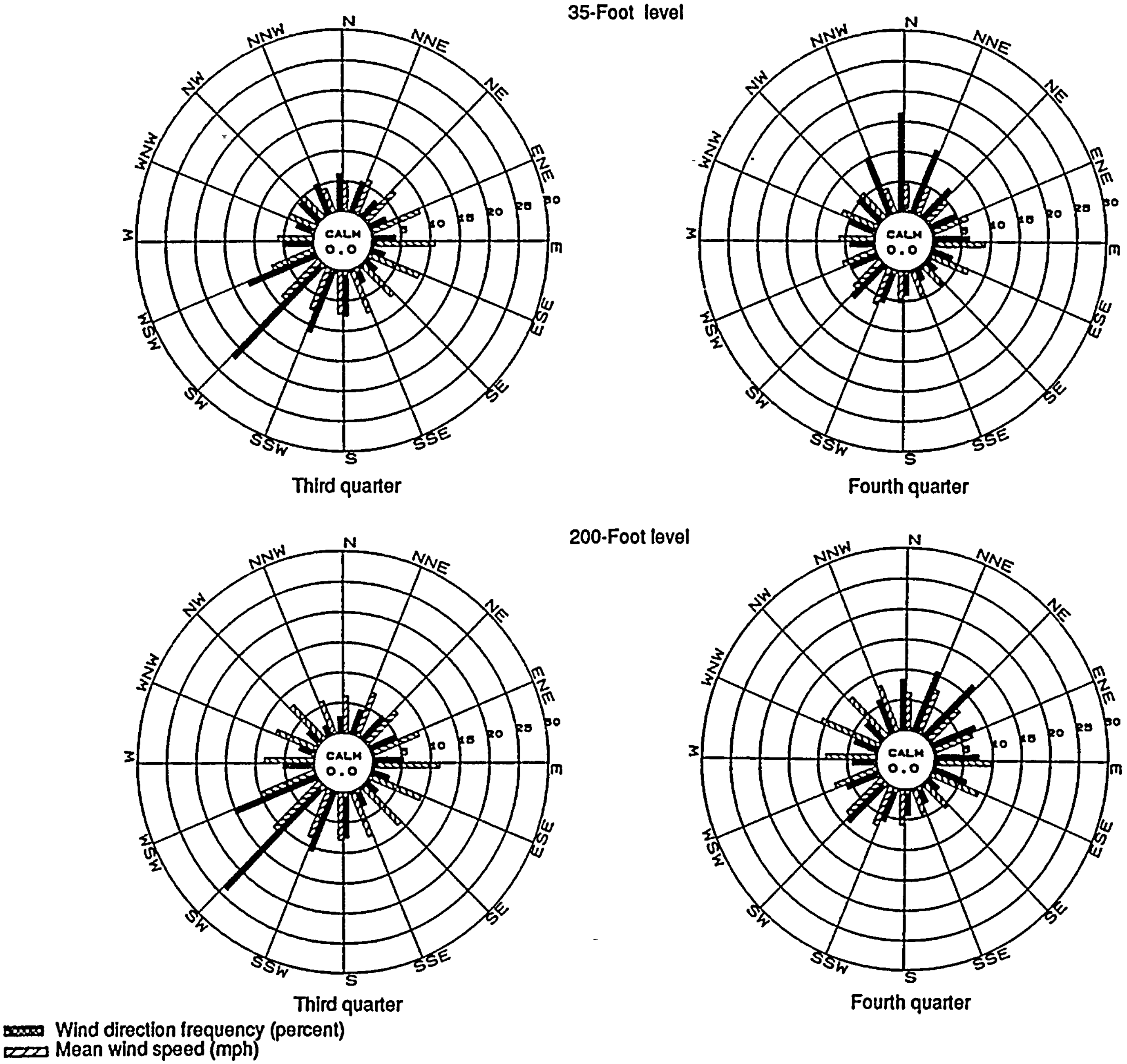

Figure 3-6. Gross wind roses for PVNGS, third and fourth quarters 1991

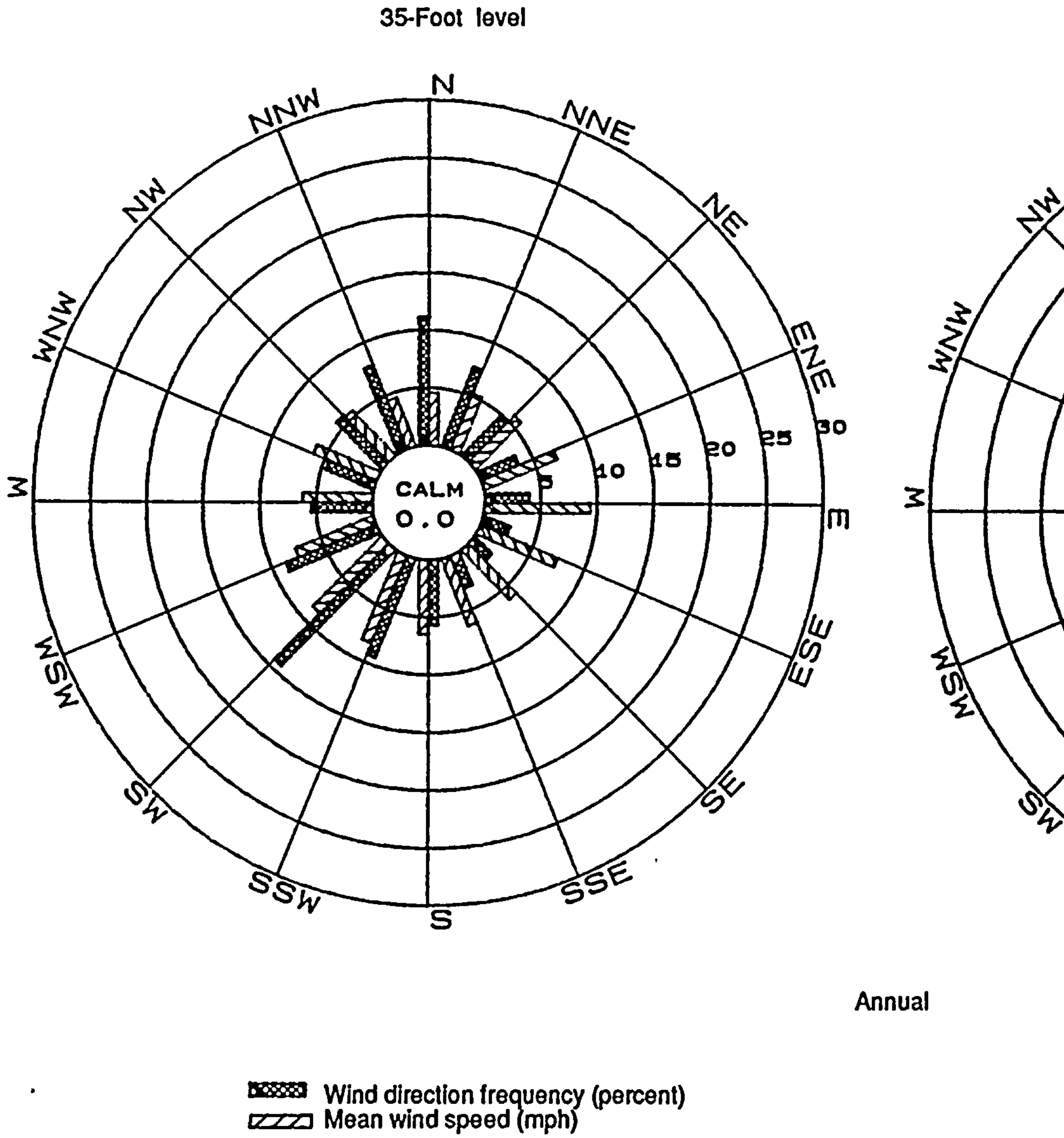

Figure 3-7. Gross annual wind roses for PVNGS, 1991

4 Plant Operation

4.1 COOLING TOWER OPERATION

During 1991, Units 1, 2, and 3 of PVNGS continued commercial operation. Operating data for all three units were analyzed to provide estimates of drift emissions from each unit for the year. Such data included the dissolved solids content of the circulating water as indicated by daily conductivity measurements (see Section 4.3), the number of circulating water pumps and the number of cooling tower fans in operation on each shift, and the thermal energy generated per day.

In October 1990, a drift measurement test was performed on the same four cells of cooling tower 1C that were tested in 1983 to determine the drift emission rate and drop size distribution of the Unit 1 cooling towers (ESC, 1990). The drift rate at full fan flow was determined to be 0.00075 percent of the circulating water flow rate based on the results of both sensitive paper and isokinetic sampling. The previous drift rate was determined to be 0.0002 percent of the circulating water flow rate (ESC, 1983). A physical inspection of the cooling towers during operation of the three units in 1990 indicated clear differences in the physical condition of Units 1 and 2 which were likely to influence their drift emissions. Accordingly, the 1990 determined drift rate of 0.00075 percent was applied to the drift emission calculations for Units 1 and 2 in 1991. The originally determined drift rate of 0.0002 percent was retained for the drift emission calculations for Unit 3 in 1991. The drift rate under natural draft (no fans in operation) in these towers was assumed to be zero.

Table 4-1 shows the monthly average operating parameters and calculated drift emissions for each unit at PVNGS for 1991. Figure 4-1 presents the thermal energy produced per month by each of the units as well as the average monthly combined drift emission rate from all of the units. This figure indicates the general correspondence of energy generation and drift rate. The daily plant data summaries and the calculated parameters from which the monthly values were derived for this period are presented by month in Appendix A.

4.2 COOLING TOWER BASIN WATER QUALITY

Cooling tower basin water was sampled monthly throughout 1991 for all units operating on the day the samples were collected. Thus, Unit 1 was not sampled in January, Unit 2 was not sampled in October through December, and Unit 3 was not sampled in April and May. Additionally, a sampling of Units 1 and 2 was not performed in May although the units were operating. The objective of the sampling was to determine the concentration of dissolved solids and selected trace elements in the circulating water.

The results of the individual basin water analyses are presented in Appendix B. A summary of these individual analyses for each of the units is presented in Table 4-2. This table presents, for each analyte, the average of the measured concentrations, the range of values observed over the period, and the coefficient of variation (the standard deviation of the monthly values divided by their mean). For those analytes reported as below the laboratory detection limit, a value equal to one-half the laboratory detection limit is used to calculate the mean. The minimum range value reported represents the laboratory detection limit preceded by a "less than" (<) symbol.

The coefficients of variation, although relatively large for some minor constituents (arsenic and lead in Unit 1; ammonium in Unit 2; arsenic, lead, and phenol in Unit 3), were generally within the range calculated for the major constituents in 1990. TDS concentrations ranged from 11,000 to 32,000 milligrams per liter over the year; the mean values were 25,500, 23,750, and 22,500 milligrams per liter for Units 1, 2, and 3, respectively.

The annual average concentrations for 10 of the 30 analytes exceeded the average ER-OL values (PVNGS, 1979) for Units 1, 2, or 3. These 10 included calcium, sodium, chloride, sulfate, phosphate, potassium, iron, boron, TDS, and selenium. Moreover, 12 analytes (the 10 listed above plus arsenic and barium) exceeded the maximum ER-OL values in one or more months of 1991.

Table 4-2 also presents the annual average ratios of the concentration of sodium to that of potassium, calcium, magnesium, nitrate, chloride, and sulfate, as well as the coefficients of variation for these ion ratios. For

all three units the sodium-to-potassium, sodium-to-chloride, and sodium-to-sulfate coefficients of variation for the ion ratios are smaller than those for the individual ions, indicating a greater consistency in the relationship of these concentrations to one another than in the concentrations themselves. The remaining coefficients of variation for the ion ratios are greater than those of the respective individual ions.

During 1991, as in previous years, cooling tower makeup water was obtained from treated Phoenix waste water, after treatment by the PVNGS water reclamation plant. The average annual effective concentration factors achieved by the cooling tower operations for Units 1, 2, and 3 in 1991, calculated in reference to an annual mean value for TDS in the reservoir water of 1,295 milligrams per liter, were determined to be 19.7, 18.3, and 17.4 for Units 1, 2, and 3, respectively.

As in the analysis of 1990 operations, to minimize the influences of water chemistry control and biocide additives on TDS values, the annual average calcium concentration in the reservoir water (59.7 milligrams per liter) was used as a basis for determining effective cooling tower concentration factors. This approach yielded apparent concentration factors relative to the reservoir water of 6.8, 7.4, and 5.8 for Units 1, 2, and 3, respectively.

A third determination of the effective cycles of concentration was made using potassium as a tracer. This element should not be influenced either by water chemistry control additions or by the water reclamation plant processes. With a mean annual value of 21.4 milligrams per liter in the reservoir water, the mean annual concentrations of potassium in the cooling tower basin water (390, 374, and 322 milligrams per liter in Units 1, 2, and 3, respectively) would yield a mean annual concentration factor in the range of 15.0 to 18.2.

Ratios of TDS to conductivity for each unit were determined from cooling tower basin water monthly sample TDS values and plant operating data conductivity values measured on the same day. The samples from Units 1, 2, and 3 displayed monthly variation during 1991, ranging from a low of 0.69 in August to a high of 0.90 in March for Unit 3, as shown in Figure 4-2. Because of this variation, TDS concentrations were determined by applying the Unit 1, Unit 2, and Unit 3 ratios for each month to the monthly mean of daily

conductivity measurements for each unit rather than applying an average annual ratio. For those months for which samples or analyses were missing and some unit operation occurred, the annual mean of all ratio values for each unit (0.82, 0.78, and 0.83 for Units 1, 2, and 3, respectively) was used. These values are indicated in the footnotes to the monthly plant operating data sheets presented in Appendix A.

4.3 DRIFT DEPOSITION MODELING

The NUS computer code FOG was used to calculate the deposition of dissolved salts emitted as drift by the cooling towers of each of the three PVNGS units for the entire year, each quarter, and each month of 1991 when the units and their cooling towers were in operation. PVNGS Unit 1 was in operation throughout 1991; Unit 2 was not in operation in November and December 1991; and Unit 3 was not in operation in April and May 1991. PVNGS Units 1, 2, and 3 were in operation for the entire first and third quarters (January through March and July through September 1991), although Unit 1 was shut down for three weeks in January, two weeks in February, and about one week in September; Unit 2 was shut down for a week in August; and Unit 3 was shut down for two weeks in March.

The drop sizes measured in the 1990 test program (ESC, 1990) identified a size distribution spectrum which differs significantly from that determined in the earlier tests (ESC, 1983). Of particular note is the much more significant contribution of large diameter droplets to the total drift mass of droplets in the recent tests than in the original test program, the mass median diameter increasing from about 390μ in the earlier tests to about 1400μ in the recent tests. The results from the two test series, as distributed in the 16 size classes or "bins" used in the FOG model, are presented in Table 4-3. The 1990 drop size distribution was used in conjunction with a drift rate of 0.00075 percent for Units 1 and 2, and the previous drop size distribution and drift rate of 0.0002 percent were used for Unit 3, in predicting drift deposition with the NUS-FOG model.

The FOG code used sequential hourly meteorological data for 1991 obtained from the PVNGS meteorological tower system. The deposition calculations were performed for each unit in operation with daily plant operating data

(Appendix A) and hourly onsite meteorological data. The combined drift deposition for Units 1, 2, and 3 was calculated by summing the individual drift contributions from each of these units.

Figures 4-3 and 4-4 reflect the results of this drift deposition modeling for the year in onsite and offsite areas, respectively. The maximum calculated annual offsite deposition was approximately 93 pounds per acre per year along the site boundary west and southwest of Unit 3. This value resulted primarily from the operation of all three units during the second half of the year (i.e., third and part of fourth quarters). The general deposition patterns remain unchanged from 1990; however, the area within each isopleth has increased as a result of the near full power operation of the three units during 1991, as well as higher drift rate for Units 1 and 2. The maximum calculated onsite deposition (in excess of 10,000 lb/acre) is also higher for 1991 than for 1990 (5,000 lb/acre).

Figure 4-4 indicates that the maximum drift deposition calculated at an agricultural site in 1991 was about 3 pounds per acre at site 23, about 2.5 miles southwest of the power block. Figures 4-5 through 4-8 present the results of the onsite drift deposition modeling for each quarter of 1991. Although the magnitude of drift deposition varies from quarter to quarter due to varying operation of cooling towers the drift deposition patterns remain similar for all quarters.

The predicted monthly and annual drift deposition at each of the onsite monitoring sites is summarized in Table 4-4. The highest predicted deposition occurs during the months of April through September at site 81, 0.2 mile north-northwest of the Unit 2 cooling towers and about the same distance west of those for Unit 1. This deposition pattern is consistent with the predominant wind directions for this season, as depicted in Figures 3-1 through 3-6. Overall, the highest predicted monthly deposition is 1670 pounds per acre at site 81 in July with a predicted annual total in excess of 10,000 lb/acre. The isopleths defining the higher deposition rates (100 pounds per acre per quarter and higher) were all in the vicinity of the PVNGS cooling towers. A comparison of the predicted and measured deposition rates for 1991 is presented in Section 9.3.

Table 4-1. Power operation and cooling tower parameters for PVNGS, 1991 (sheet 1 of 2)

Month	Heat generation		Airflow (m^3/sec)			Circulating water		Calculated drift*	
	Btu/min	MWt/d	Tower 1	Tower 2	Tower 3	Flow (gpm)	TDS (ppm)	Gpm	Lb/min
				Unit 1					
January	7.62E+07†	32,145	3,703	3,703	3,192	242,763	17,834	1.530	0.256
February	9.18E+07	38,714	4,333	4,220	4,137	300,667	13,685	1.842	0.247
March	2.16E+08	91,055	10,128	9,897	10,121	589,000	24,054	4.383	0.880
April	2.16E+08	91,059	10,128	10,072	10,128	589,000	23,957	4.409	0.881
May	2.16E+08	91,104	10,114	10,128	10,128	589,000	22,259	4.416	0.820
June	2.15E+08	90,846	10,051	9,706	10,114	589,000	21,488	4.343	0.779
July	2.16E+08	91,157	10,067	10,128	10,094	587,495	22,292	4.393	0.817
August	2.16E+08	91,125	9,917	10,121	10,128	589,000	25,816	4.386	0.945
September	1.36E+08	57,530	6,872	5,992	6,865	463,000	27,505	2.854	0.671
October	1.82E+08	76,969	8,821	8,767	8,760	551,366	31,960	3.818	1.044
November	2.13E+08	90,015	10,121	9,973	9,847	589,000	29,682	4.353	1.082
December	2.16E+08	91,046	10,128	9,502	9,447	589,000	30,081	4.228	1.061
				Unit 2					
January	2.15E+08	90,677	9,822	9,720	9,903	589,000	19,651	4.281	0.702
February	2.16E+08	91,291	10,015	9,781	9,834	589,000	21,387	4.308	0.769
March	2.14E+08	90,235	9,863	9,965	9,917	589,000	24,475	4.324	0.881
April	2.16E+08	91,118	10,015	9,980	9,819	589,000	23,619	4.335	0.854
May	2.16E+08	91,175	10,128	9,808	10,128	589,000	20,856	4.371	0.761
June	2.16E+08	91,147	10,058	9,875	10,128	589,000	21,263	4.370	0.775
July	2.16E+08	91,137	10,040	9,863	10,128	589,000	23,427	4.366	0.854
August	1.35E+08	56,779	6,609	6,330	6,323	491,151	26,389	2.764	0.621
September	2.16E+08	91,061	10,065	10,128	10,128	589,000	28,063	4.408	1.032
October	1.11E+08	46,929	5,003	5,132	5,091	333,086	23,850	2.200	0.540
November	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
December	0.00E+00	0	0	0	0	29,000	0	0.000	0.000

Table 4-1. Power operation and cooling tower parameters for PVNGS, 1991 (sheet 2 of 2)

Month	Heat generation		Airflow (m^3/sec)			Circulating water		Calculated drift*	
	Btu/min	MWt/d	Tower 1	Tower 2	Tower 3	Flow (gpm)	TDS (ppm)	Gpm	Lb/min
				Unit 3					
January	2.15E+08	90,793	10,087	9,747	9,284	589,000	11,845	1.129	0.112
February	2.16E+08	91,004	10,128	8,335	9,495	589,000	14,076	1.084	0.127
March	8.21E+07	34,644	5,003	4,635	1,776	321,043	16,699	0.440	0.066
April	0.00E+00	0	0	0	0	29,000	13,084	0.000	0.000
May	0.00E+00	0	0	0	0	101,258	10,219	0.000	0.000
June	1.47E+08	62,056	6,428	7,272	7,624	543,889	16,013	0.823	0.122
July	2.12E+08	89,468	10,128	9,985	10,053	589,000	22,866	1.170	0.223
August	2.09E+08	88,166	9,910	9,910	9,910	587,495	25,432	1.152	0.244
September	1.91E+08	80,411	8,989	8,834	9,397	585,889	28,574	1.055	0.254
October	1.85E+08	78,014	8,603	8,603	8,658	566,419	32,239	1.002	0.275
November	1.15E+08	48,532	5,760	5,500	4,283	548,556	26,307	0.603	0.137
December	2.15E+08	90,756	9,529	9,549	9,325	589,000	29,745	1.101	0.274

*Based on drift rate at full fan flow of 0.00075 percent of circulating water flow for Units 1 and 2 and a drift rate at full fan flow of 0.0002 percent for Unit 3.

†7.62E+07 = 7.62 X 10^7.

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1991 (sheet 1 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 1: Concentrations†		
Calcium, total	403	330-490	0.147	420.0
Magnesium, total	30.7	18.0-44.0	0.302	150.0
Sodium, total	8,200	6,000-9,900	0.146	3,375.0
Chloride	8,590	5,700-10,000	0.169	2,400.0
Sulfate (as SO_4)	6,260	3,700-9,200	0.261	2,250.0
Nitrate (as N)	369	280-470	0.207	1,650.0
Silica (as SiO_2)	106.7	73-130	0.157	150.0
Phosphate	1.79	0.66-3.40	0.499	1.5
Fluoride	20.9	4.6-28	0.311	52.5
Potassium, total	390	290-480	0.158	207.0
Copper, total	0.06	0.040-0.083	0.203	0.3
Zinc, total	0.046	0.029-0.076	0.326	1.0
Iron, total	0.42	0.31-0.67	0.257	0.075
Arsenic, total	0.06	<0.50	1.230	0.12
Boron	6.58	5.4-8.0	0.122	0.56
Ammonium (as N)	0.51	0.2-0.7	0.325	75.0
TSS (at 105°C)	42.1	13-77	0.444	150.0
COD	495	340-650	0.222	1,305.0
Alkalinity, total	44.3	26-67	0.297	1,500.0
TDS (at 180°C)	25,500	20,000-32,000	0.149	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.11	0.1-0.2	0.291	0.15
Cadmium, total	0.003	<0.005-0.007	0.333	0.015
Chromium, total	0.032	0.022-0.046	0.188	0.06
Lead, total	0.051	<0.20-0.28	1.686	0.3
Mercury, total	0.0004	<0.0002-0.0005	0.337	0.0015
Beryllium, total	0.003	<0.005-0.008	0.667	0.3
Selenium, total	0.056	<0.20	0.500	0.015
Manganese, total	0.011	0.006-0.016	0.273	0.75
Phenol	0.007	<0.005-0.019	0.714	0.14
Conductivity (µmhos/cm)	42,100	34,000-50,000	0.141	--
		Unit 1: Ion Ratios		
Sodium/potassium	21.1	--	0.05	--
Sodium/calcium	20.9	--	0.24	--
Sodium/magnesium	291.8	--	0.33	--
Sodium/nitrate	23.1	--	0.25	--
Sodium/chloride	0.96	--	0.11	--
Sodium/sulfate	1.4	--	0.16	--

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1991 (sheet 2 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 2: Concentrations†		
Calcium, total	443	340-530	0.122	420.0
Magnesium, total	37.5	18-71	0.435	150.0
Sodium, total	7,588	6,500-9,400	0.135	3,375.0
Chloride	8,063	6,100-11,000	0.221	2,400.0
Sulfate (as SO_4)	5,450	3,800-7,400	0.211	2,250.0
Nitrate (as N)	396.3	280-540	0.237	1,650.0
Silica (as SiO_2)	116.3	100-140	0.130	150.0
Phosphate	1.72	0.66-3.50	0.637	1.5
Fluoride	17.0	5.0-25.0	0.356	52.5
Potassium, total	374	290-440	0.151	207.0
Copper, total	0.063	0.052-0.084	0.159	0.3
Zinc, total	0.042	0.030-0.056	0.238	1.0
Iron, total	0.378	0.28-0.53	0.209	0.075
Arsenic, total	0.023	<0.10	0.522	0.12
Boron	6.5	5.5-8.7	0.158	0.56
Ammonium (as N)	0.937	0.3-3.7	1.203	75.0
TSS (at 105°C)	41.0	20-68	0.379	150.0
COD	525	260-780	0.333	1,305.0
Alkalinity, total	41.3	31-67	0.291	1,500.0
TDS (at 180°C)	23,750	21,000-29,000	0.116	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.125	0.1-0.2	0.368	0.15
Cadmium, total	0.003	<0.005-0.006	0.333	0.015
Chromium, total	0.028	0.024-0.031	0.107	0.06
Lead, total	0.013	<0.050	0.462	0.3
Mercury, total	0.0003	0.0002-0.0004	0.267	0.0015
Beryllium, total	0.003	<0.005-0.008	0.667	0.3
Selenium, total	0.045	<0:20	0.600	0.015
Manganese, total	0.012	0.007-0.016	0.250	0.75
Phenol	0.005	<0.005-0.008	0.400	0.14
Conductivity (µmhos/cm)	40,500	35,000-55,000	0.162	--
		Unit 2: Ion Ratios		
Sodium/potassium	20.5	--	0.11	--
Sodium/calcium	17.4	--	0.18	--
Sodium/magnesium	238.5	--	0.44	--
Sodium/nitrate	20.4	--	0.31	--
Sodium/chloride	0.96	--	0.13	--
Sodium/sulfate	1.42	--	0.14	--

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1991 (sheet 3 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 3: Concentrations†		
Calcium, total	345	220-450	0.209	420.0
Magnesium, total	25.9	18.0-34.0	0.166	150.0
Sodium, total	6,930	3,200-9,600	0.326	3,375.0
Chloride	7,500	3,400-10,000	0.349	2,400.0
Sulfate (as SO_4)	5,500	2,200-9,800	0.412	2,250.0
Nitrate (as N)	324	260-520	0.241	1,650.0
Silica (as SiO_2)	101	64-140	0.239	150.0
Phosphate	1.6	0.62-2.60	0.428	1.5
Fluoride	17.6	4.8-28.0	0.465	52.5
Potassium, total	322	150-430	0.337	207.0
Copper, total	0.058	0.037-0.120	0.397	0.3
Zinc, total	0.039	0.022-0.073	0.385	1.0
Iron, total	0.389	0.24-0.53	0.239	0.075
Arsenic, total	0.053	<0.5	1.415	0.12
Boron	5.78	3.3-8.8	0.283	0.56
Ammonium (as N)	0.38	0.2-0.6	0.300	75.0
TSS (at 105°C)	38.6	17-60	0.447	150.0
COD	406	150-680	0.423	1,305.0
Alkalinity, total	36.6	26-56	0.207	1,500.0
TDS (at 180°C)	22,500	11,000-32,000	0.321	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.085	<0.1	0.282	0.15
Cadmium, total	0.003	<0.005	N/A	0.015
Chromium, total	0.030	0.017-0.054	0.400	0.06
Lead, total	0.043	<0.20-0.23	1.651	0.3
Mercury, total	0.0004	0.0002-0.0006	0.299	0.0015
Beryllium, total	0.003	<0.005	N/A	0.3
Selenium, total	0.052	<0.2	0.596	0.015
Manganese, total	0.012	0.008-0.013	0.167	0.75
Phenol	0.006	<0.005-0.017	0.833	0.14
Conductivity (µmhos/cm)	37,000	21,000-52,000	0.298	–
		Unit 3: Ion Ratios		
Sodium/potassium	21.7	–	0.06	–
Sodium/calcium	19.9	–	0.25	–
Sodium/magnesium	276.0	–	0.37	–
Sodium/nitrate	21.9	–	0.35	–
Sodium/chloride	0.94	–	0.10	–
Sodium/sulfate	1.31	–	0.14	–

Key: COV, coefficient of variation; N/A, not applicable; TSS, total suspended solids; COD, chemical oxygen demand; TDS, total dissolved solids.

*Standard deviation/mean.

†In milligrams per liter except where otherwise indicated.

NOTE: Statistics based on a sample size of 10 for Unit 1, 8 for Unit 2, and 10 for Unit 3.

NOTE: Averages computed using 1/2 the detection limit for values reported below the detection limit.

Table 4-3. Drop size distribution, PVNGS Cooling Tower 1C

	1990 ESC measurement		1983 ESC measurement	
Bin	Mean radii, cm	Mass fraction	Mean radii, cm	Mass fraction
1	0.0015	0.02828	0.00150	0.05000
2	0.0030	0.07036	0.00350	0.08780
3	0.0045	0.04583	0.00625	0.03720
4	0.0080	0.07458	0.009375	0.06460
5	0.01275	0.05786	0.01250	0.06040
6	0.0175	0.05126	0.01475	0.09000
7	0.0225	0.03907	0.01650	0.07000
8	0.0325	0.05270	0.01800	0.08180
9	0.0500	0.05240	0.01950	0.07820
10	0.0650	0.04262	0.02100	0.08000
11	0.0800	0.07973	0.02295	0.09760
12	0.0950	0.06170	0.024625	0.06240
13	0.1050	0.06169	0.02650	0.05640
14	0.1150	0.13025	0.03000	0.04150
15	0.1450	0.05398	0.03500	0.01640
16	0.1750	0.09769	0.05000	0.02570

Table 4-4. Predicted drift deposition at PVNGS onsite monitoring locations, 1991

Site	Monthly deposition (lb/acre)												Annual deposition (lb/(acre)(yr))
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	9.23E-01	7.77E-01	1.79E+00	1.39E+00	1.75E+00	1.83E+00	1.68E+00	1.58E+00	1.51E+00	1.41E+00	3.22E-01	1.51E+00	1.63E+01
2	6.69E-01	4.99E-01	1.52E+00	1.19E+00	1.16E+00	1.39E+00	1.61E+00	1.05E+00	9.17E-01	1.02E+00	5.35E-01	1.36E+00	1.29E+01
3	9.21E-01	5.39E-01	3.39E+00	1.43E+00	1.04E+00	1.80E+00	7.27E-01	1.65E+00	1.96E+00	1.12E+00	1.33E+00	1.45E+00	1.68E+01
4	9.96E-01	5.12E-01	8.84E-01	6.93E-01	3.18E-01	3.64E-01	3.16E-01	5.54E-01	7.24E-01	1.00E+00	1.90E+00	2.05E+00	9.76E+00
5	4.38E-01	4.15E-01	2.12E-01	6.34E-02	6.23E-02	3.98E-02	1.24E-01	1.54E-01	3.01E-01	2.35E-01	2.58E-01	2.77E-01	2.64E+00
6	6.85E-01	3.92E-01	2.44E-01	2.69E-01	1.22E-01	1.20E-01	6.84E-02	8.60E-02	3.42E-01	2.82E-01	4.71E-01	4.93E-01	3.47E+00
10	4.36E-01	2.53E-01	8.96E-01	9.27E-01	6.53E-01	8.54E-01	1.66E+00	9.05E-01	6.15E-01	1.03E+00	3.42E-01	5.78E-01	8.86E+00
14	2.29E+00	1.96E+00	3.30E+00	6.08E+00	7.43E+00	4.99E+00	6.62E+00	4.87E+00	3.96E+00	4.30E+00	1.81E+00	4.10E+00	5.14E+01
16	1.23E+01	9.68E+00	5.88E+01	3.32E+01	4.05E+01	5.48E+01	3.10E+01	4.61E+01	4.51E+01	1.92E+01	4.85E+01	3.15E+01	4.58E+02
20	3.60E+00	6.95E+00	4.21E+00	3.15E+00	1.52E+00	2.62E+00	5.70E+00	1.09E+01	1.37E+01	1.59E+01	1.10E+01	1.67E+01	9.25E+01
27	1.02E+00	7.53E-01	1.34E+00	4.88E-01	3.85E-01	3.29E-01	4.25E-01	6.01E-01	7.45E-01	1.24E+00	2.05E+00	2.16E+00	1.12E+01
80	1.09E+01	6.48E+00	2.60E+01	2.52E+01	9.87E+01	3.20E+01	4.08E+01	2.35E+01	3.64E+01	1.42E+01	9.50E+00	1.67E+01	3.22E+02
81	3.51E+02	5.84E+02	9.90E+02	1.14E+03	1.08E+03	1.27E+03	1.67E+03	1.20E+03	1.48E+03	8.47E+02	6.36E+02	5.59E+02	1.18E+04
82	1.93E+01	2.07E+01	1.14E+01	5.51E+00	2.06E+00	5.72E+00	1.13E+01	1.68E+01	3.28E+01	3.97E+01	2.06E+01	3.44E+01	2.19E+02
83	9.30E+00	5.22E+00	1.09E+01	1.31E+01	6.20E+00	7.31E+00	9.18E+00	1.40E+01	1.27E+01	1.36E+01	7.87E+00	1.18E+01	1.26E+02

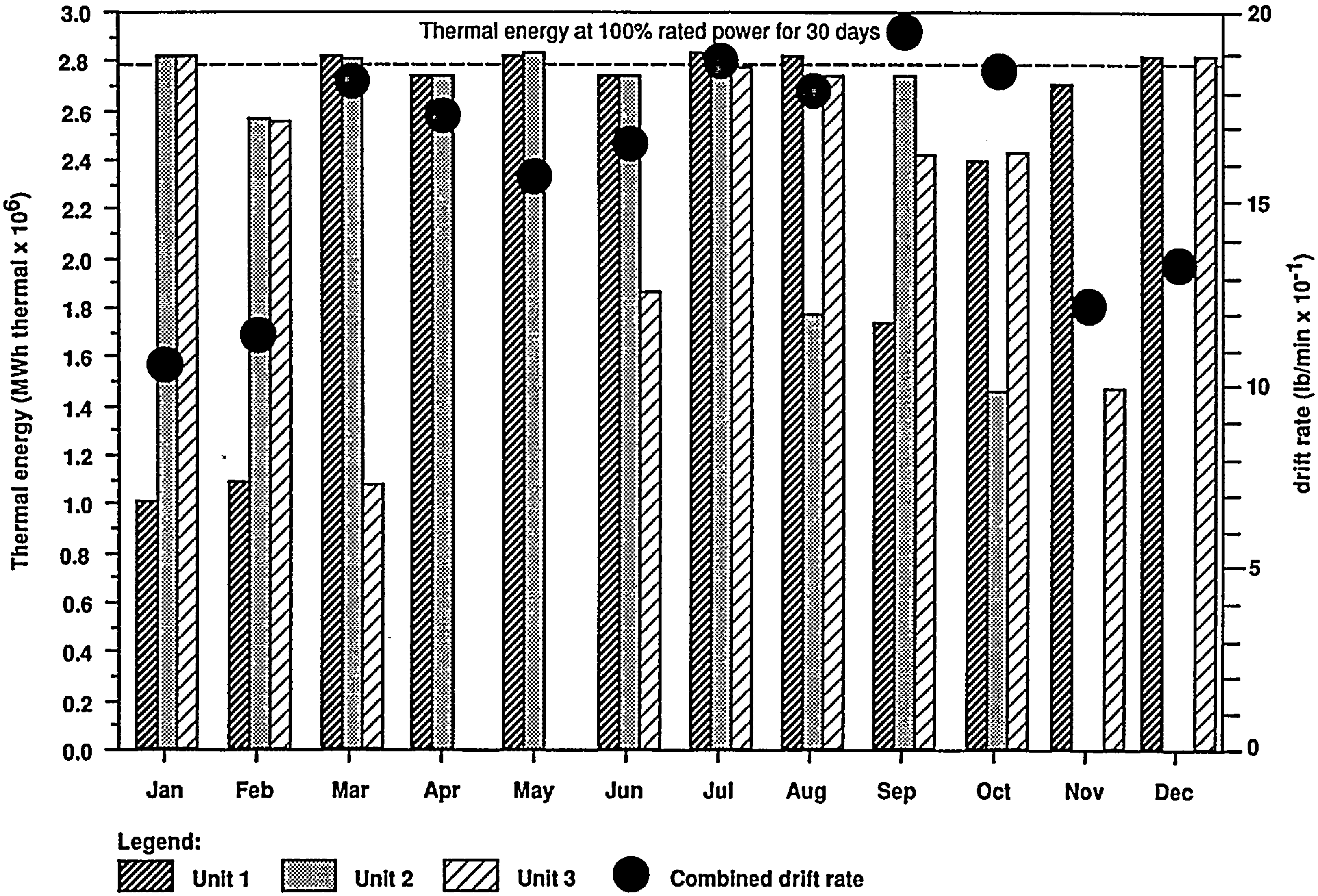

Figure 4-1. Thermal energy generation and drift rate for cooling towers at PVNGS, 1991

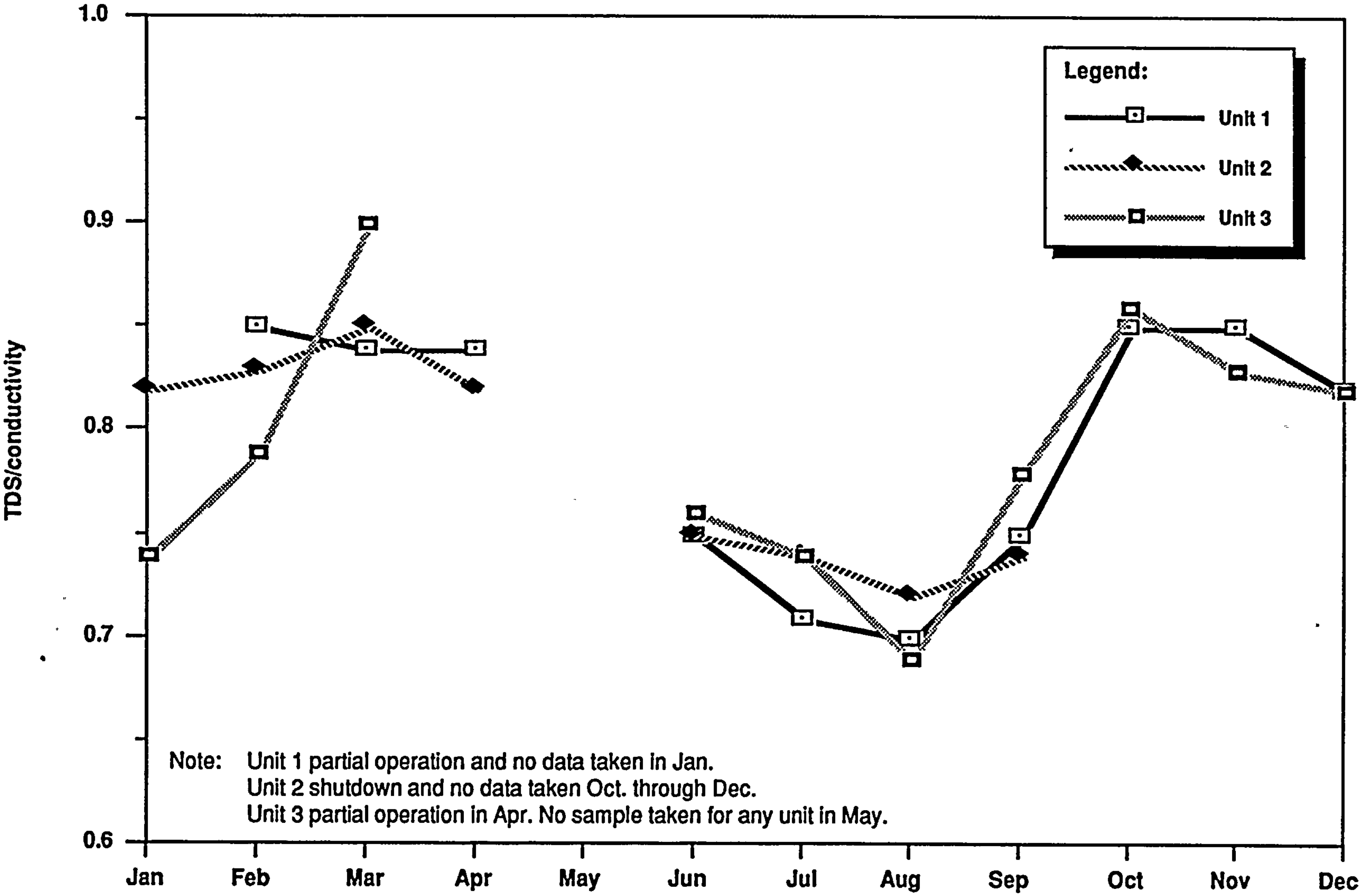

Figure 4-2. Ratio of total dissolved solids (TDS) to conductivity for cooling tower basin water at PVNGS, 1991

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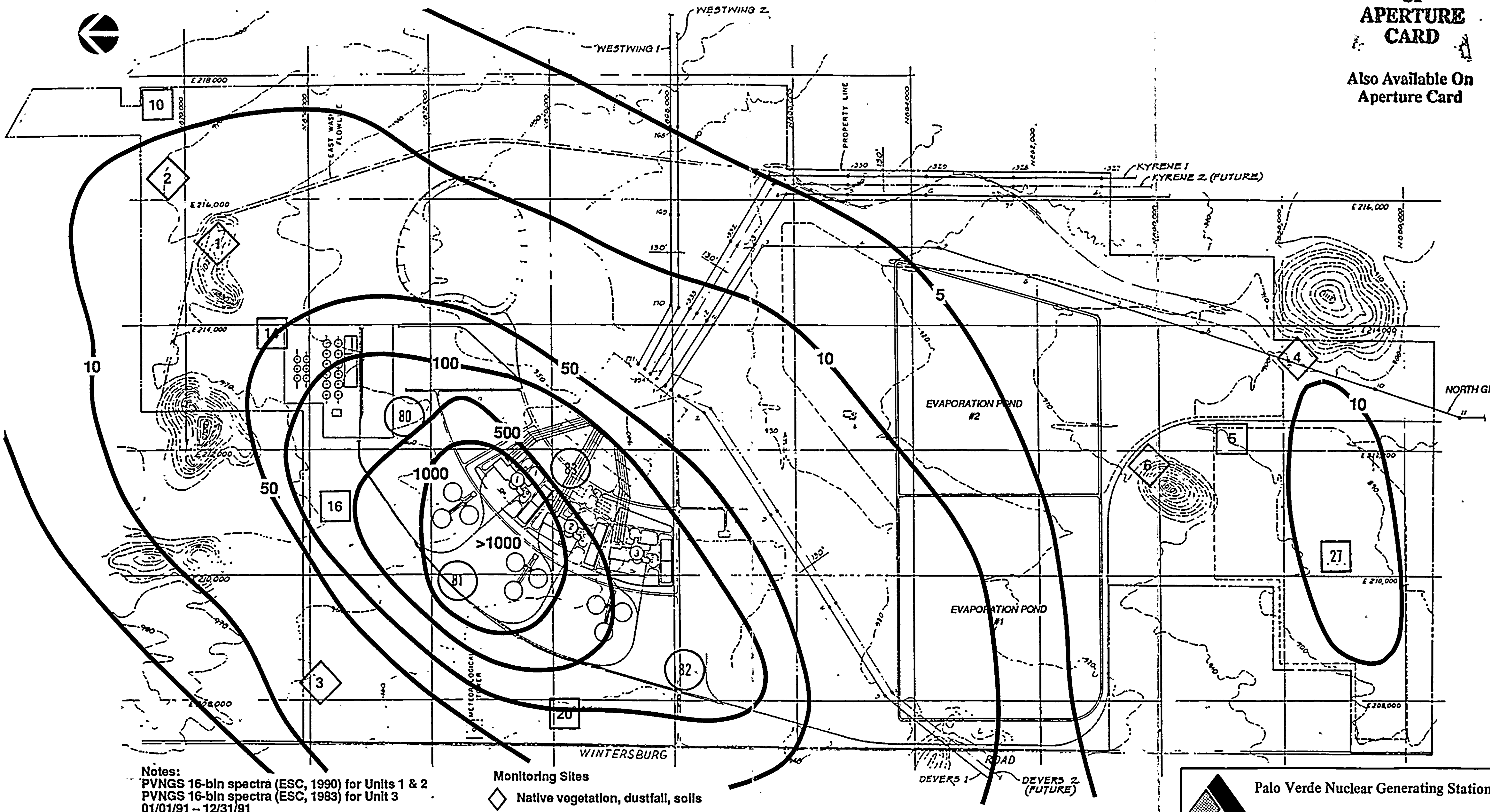


Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
01/01/91 – 12/31/91
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (yr)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

Palo Verde Nuclear Generating Station

Figure 4-3

FOG code predictions of 1991 onsite drift deposition for PVNGS Units 1, 2, and 3

9205150090-03

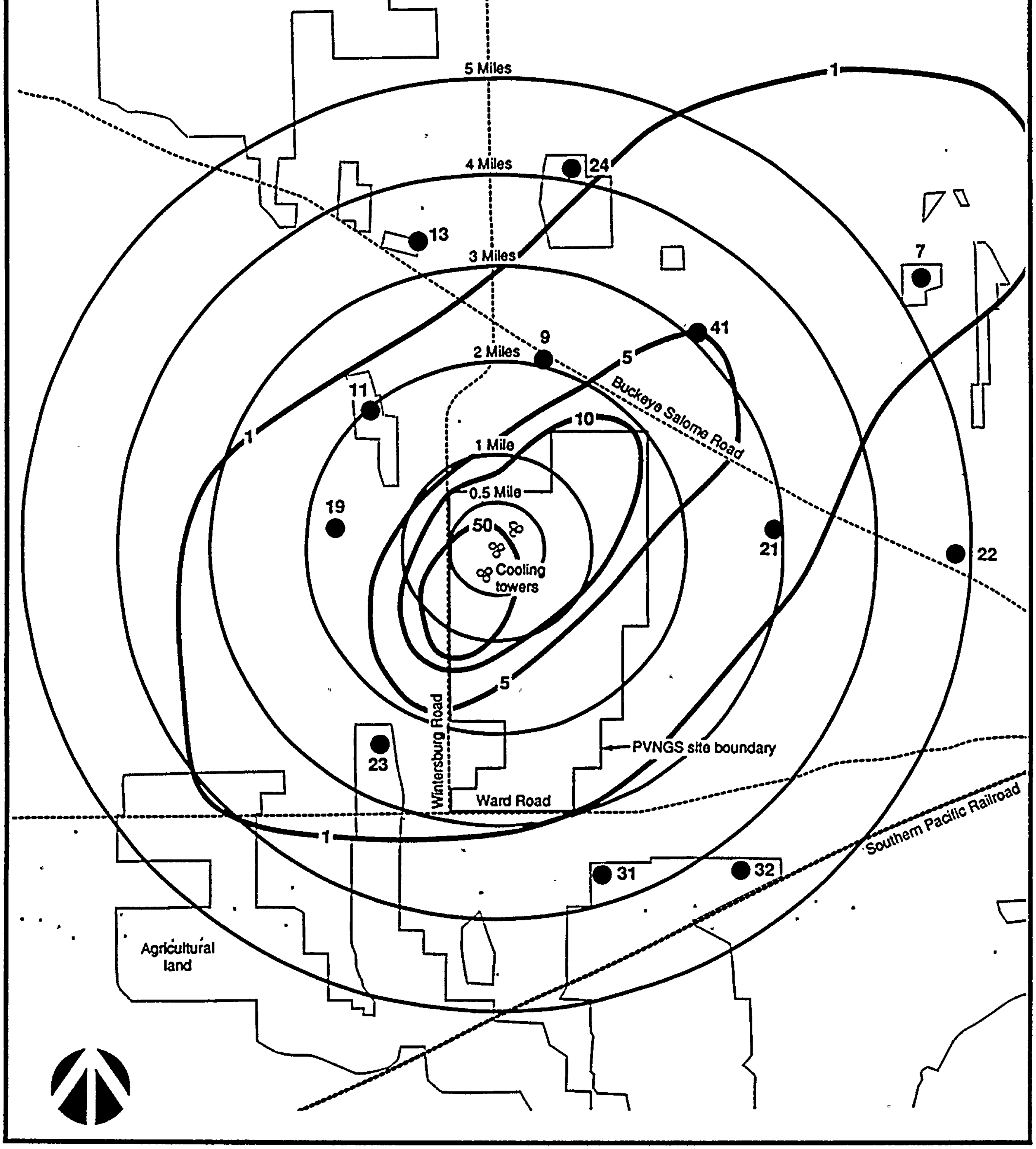
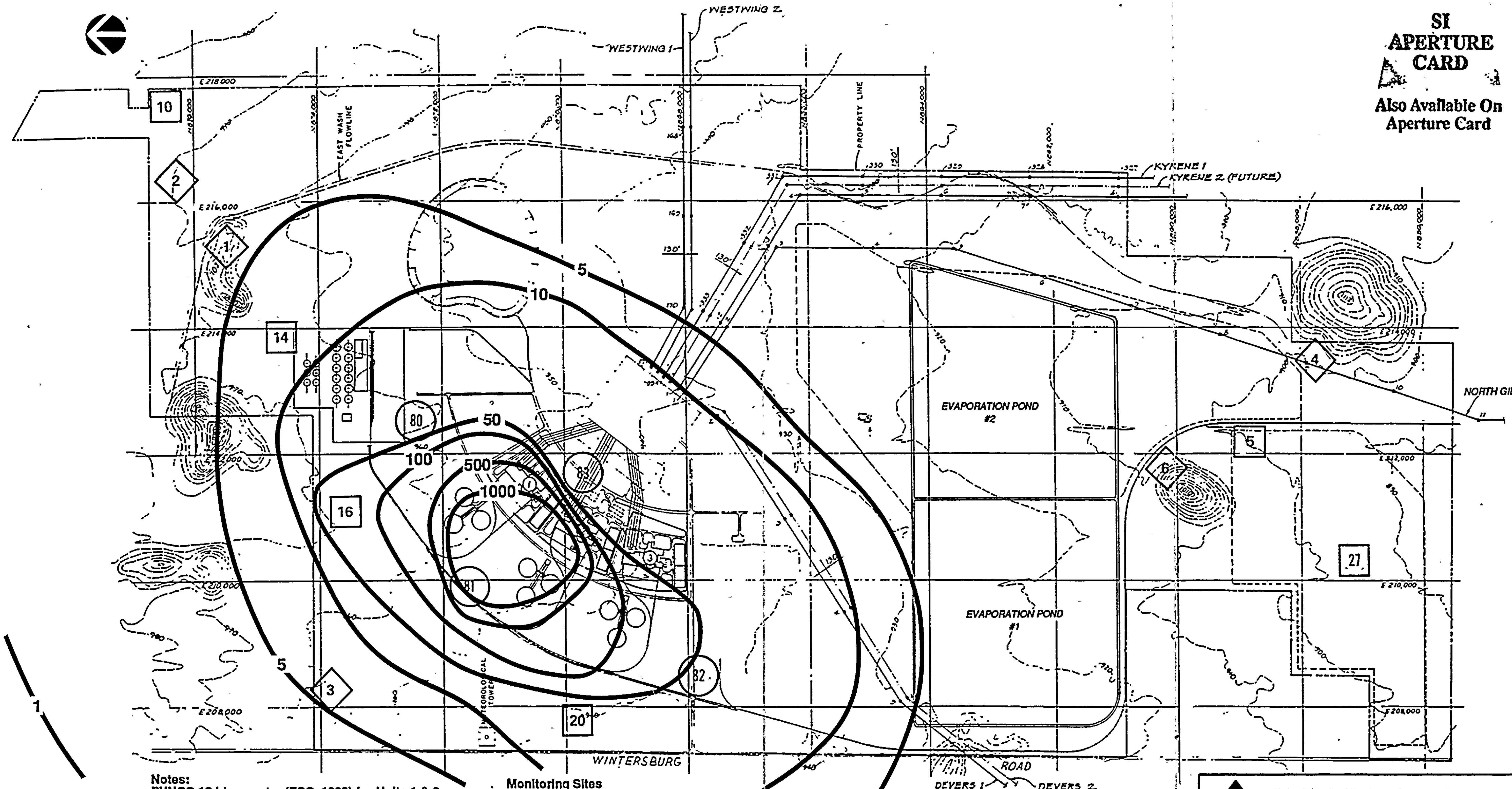


Figure 4-4. FOG code predictions of 1991 offsite drift deposition for PVNGS Units 1, 2, and 3



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
01/01/91 – 03/31/91
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

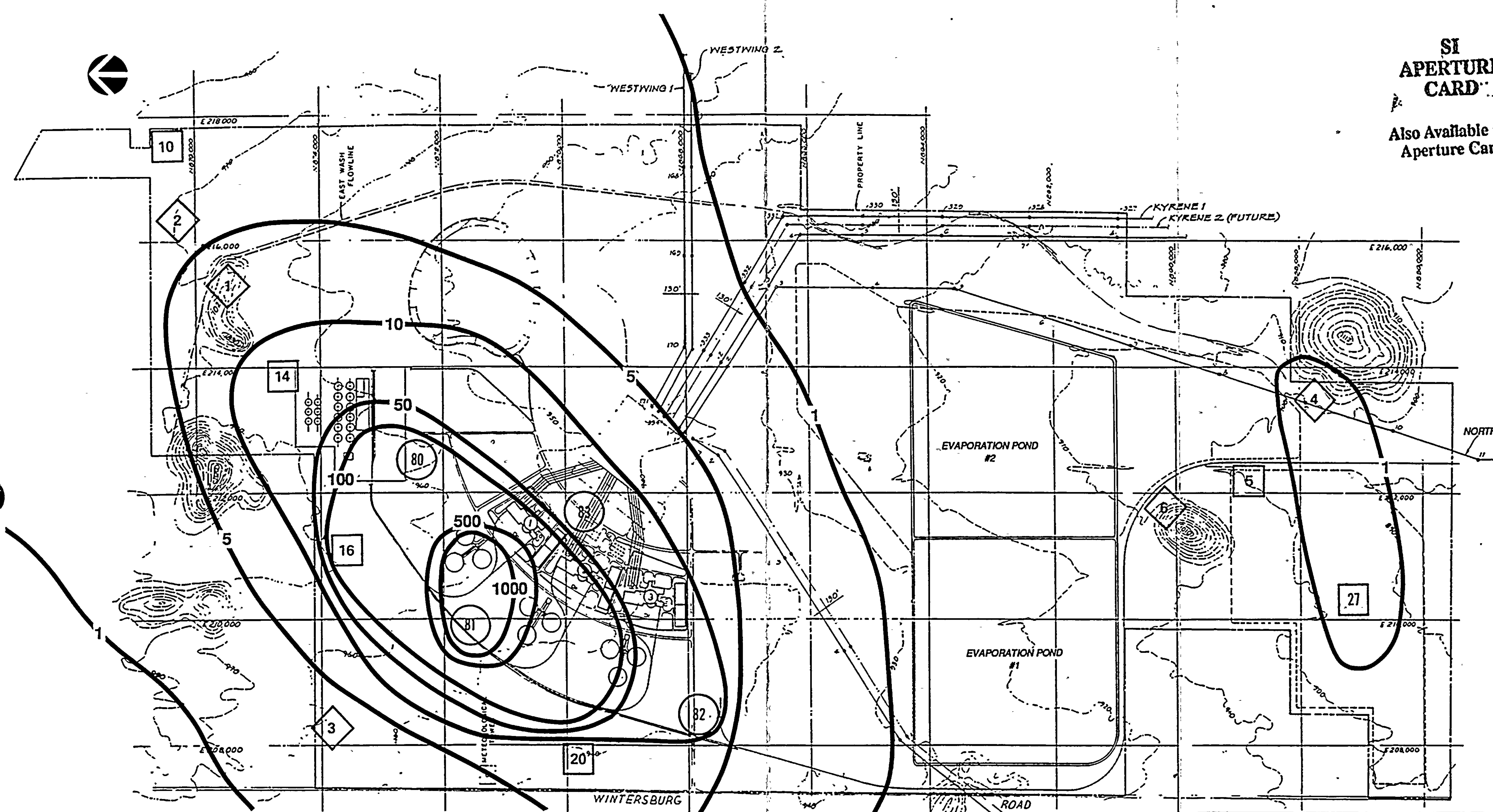
Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

Palo Verde Nuclear Generating Station

Figure 4-5

FOG code predictions of first quarter 1991 onsite drift deposition for PVNGS Units 1, 2, and 3

9205150090-04



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
04/01/91 – 06/30/91
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

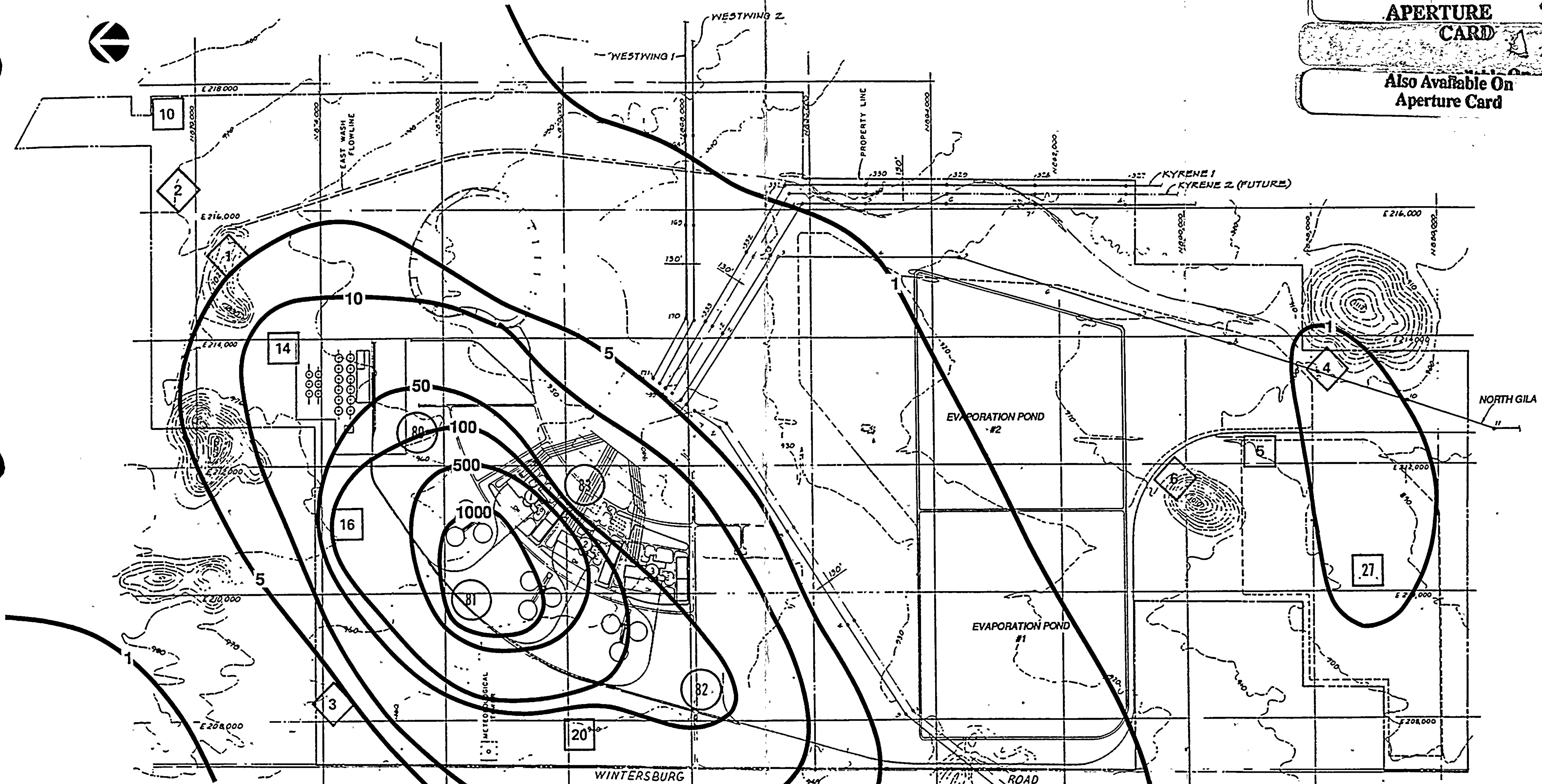
Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

Palo Verde Nuclear Generating Station

Figure 4-6

FOG code predictions of second quarter 1991 onsite drift deposition for PVNGS Units 1, 2, and 3

9205150090-05



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
07/01/91 – 09/30/91
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

Palo Verde Nuclear Generating Station

Figure 4-7

FOG code predictions of third quarter 1991 onsite drift deposition for PVNGS Units 1, 2, and 3

9205150090-06

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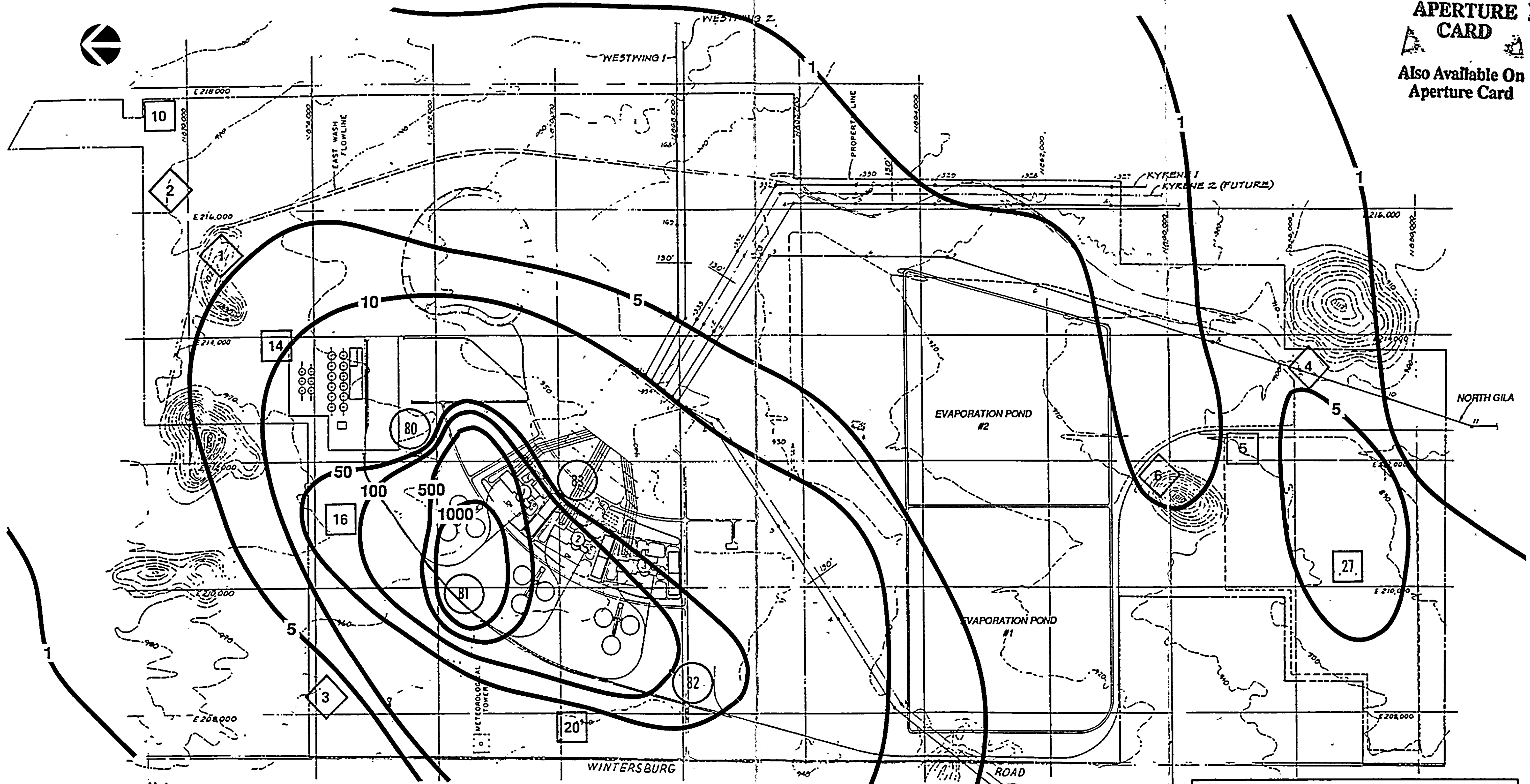

Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
10/01/91 – 12/31/91
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

Monitoring Sites

◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

600 0 600 1200 Feet

Palo Verde Nuclear Generating Station

Figure 4-8

FOG code predictions of fourth quarter 1991 onsite drift deposition for PVNGS Units 1, 2, and 3

9205150090-07

5 Salt Deposition

5.1 INTRODUCTION

In order to monitor the amount of drift deposition in the area surrounding PVNGS, samples collected during 1991 from the dustfall jars at the 44 primary monitoring locations (Figure 2-1) and at the four supplemental onsite monitoring locations (see Section 2.3) were analyzed for drift constituents.

The drift deposition data were analyzed to provide temporal and areal distributions of the deposition of ions present in the cooling tower circulating water as well as the deposition of total suspended solids (TSS). In addition, statistical analyses were performed to determine the significance of differences in the deposition of these ions between sites and to relate any observed changes to variations in cooling tower operations. The types of statistical analyses employed were based on the amounts and distributions of the deposition sample data available.

5.2 DEPOSITION DATA COLLECTION SUMMARY

The two drift deposition samples collected monthly at each of the 48 monitoring locations were analyzed for the concentration of those ions expected to constitute the majority of the salt drift from the cooling towers and for TSS. The concentrations for each analyte were converted to deposition rates in pounds per acre per month based on the collection jar surface area and each sample's collection period and water volume. This section addresses the results for the 12-month monitoring period of January 1, through December 31, 1991. Appendix C presents all results of monthly deposition analyses for the period by location.

Many of the monthly samples produced concentrations at or below the limit of detectability of the laboratory analytical procedures. Of the 14 parameters measured in each sample, fluoride, sulfate, phosphate, carbonate, bicarbonate, ammonium, and copper were routinely below their analytical detection limits.

Detection limits for the analyzed parameters are presented in Table 5-1. Also provided in the table are minimum detectable deposition rates normalized to a 12-month period and the percentage of samples whose concentrations were below detection for each constituent. These minimum deposition rates are based on the detection limit of the analysis method, a nominal monthly sample water volume and period of collection, and the surface area of the collector opening. The sample water volume available for analysis consists of the water remaining in the collector at the end of the month and the rinse water. It varies with the season and the amount of rinse water necessary to clean the dust from the collector. Since the water volume is different for each location and sample, the actual minimum detectable deposition rate for an ion varies for each sample. In Appendix C, those deposition values that are below the analytical detection limit are reported at one-half the laboratory detection limit for that analyte.

5.2.1 Special Considerations in Data Evaluation

The data listed in Appendix C are collected and processed routinely; there is no field evaluation of changes at the monitoring locations or correction for significant concentrations of the measured ions in the field blanks of the sample collection water. Field evaluation of the samples is limited to accepting or voiding a sample because of possible contamination by birds, insects, or vandalism.

Of the 13 agricultural monitoring locations, eight (sites 7, 11, 24, 25, 28, 31, 32, and 45) were fallow during the 1991 growing season. The deposition measured at these eight locations was probably less than it would be during periods of cultivation.

5.2.2 Drift Deposition Results

The method for analyzing the 1991 deposition data featured the modifications adopted in 1987 to allow for better representation of the observed data. Prior to 1987, the mean deposition for a particular monitoring location was taken as the average of the two collocated samples. Values below the detection limit were considered missing. However, beginning in 1987, each collocated sample was included as a discrete datum. Data below the detection

limit were assigned a value of one-half the detection limit. This method is suggested by Nehls and Akland (1973) for data sets containing values below the laboratory detection limit. A constraint of this method is that no more than 25 percent of the data may be below the detection limit without possibly introducing a bias in the computed statistics. Gilbert (1987) determined this method to be unbiased for the mean but not for the variance if all measurements between zero and the detection limit are uniformly distributed. A more detailed description of this method, as well as a comparison of it with previous methods, is included in NUS-5073 (NUS, 1988b).

Monthly deposition values were analyzed individually by monitoring location and month. Concentrations below the detection limit were assumed to be uniformly distributed. Sodium, calcium, and magnesium were analyzed statistically to determine the spatial and temporal variations of the data. In addition, potassium and TSS statistical comparisons are presented for consistency with previous annual reports although the percentage of analyses below the detection limit exceeds the 25 percent limit above which a bias may exist in the computed statistics.

Monthly means of deposition for each site were analyzed with least-significant-difference and F-Test statistics to determine the variability of the data throughout the study region and year. Unless stated otherwise, differences are reported as significant at the 95-percent confidence level. Although means were generated for nitrate, phosphate, ammonium, and chloride for comparison, no further statistical analysis was performed because of the high percentage of data below the detection limit.

The sites were divided into agricultural and native (i.e., nonagricultural) sites and the deposition totals of the analyzed ions examined statistically. The significance of this division can be seen in Table 5-2. The mean deposition values for potassium, calcium, magnesium, and total suspended solids were significantly higher for the agricultural sites than for the native sites; sodium and chloride were significantly higher at native sites, on average. The standard errors, which are a measure of data variability, were also larger for the agricultural sites. Further discussion of these variations is provided in Chapter 9.

5.2.2.1 Drift Deposition at Agricultural Sites

Figures 5-1 and 5-2 present the mean monthly deposition of the eight measurable ions and TSS at the 13 agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45). Generally, the variation in deposition for sodium, ammonium, chloride, calcium, and TSS was large both within a month between sites and from month to month. This can be attributed primarily to wet and dry season fugitive dust trends and to seasonal agricultural practices that release varying amounts of these ions and settleable dust into the atmosphere. Most ions had higher deposition in March, June, and November. This can be attributed to cultivation and planting in March, the dryness in June, and harvest in November.

Table 5-3 presents an analysis of the deposition of three of the primary cations (sodium, potassium, and calcium) in the cooling tower basin water for each agricultural site. Sodium at sites 23 and 30 was significantly higher than at ten other agricultural sites, of which eight (sites 7, 11, 24, 25, 28, 31, 32, and 45) were fallow during 1991. Potassium and calcium at site 23 were also significantly higher for the year than at the other 12 agricultural sites. This may be attributable to agricultural activity.

Examination of the data in Appendix C indicates that, among the agricultural sites, sites 23 and 30 had the maximum deposition rates of most ions, while sites 7, 24, 25, 28, and 31 (all fallow) had the minimum deposition rates of most ions.

5.2.2.2 Drift Deposition at Native (Nonagricultural) Sites

Figures 5-3 and 5-4 present the mean monthly deposition of eight measurable ions and total suspended solids at all the native sites (1-6, 8-10, 14-22, 26, 27, 33-42, 44, and 80-83). For the native sites, the variability of the deposition rates of all ions and TSS was large except phosphate. Sodium and chloride peaked in January and again in March. Calcium peaked in March and again in August and November. Behavior similar to that of calcium was exhibited by ammonium, potassium, and magnesium. A January maximum, a trend seen in previous years, was not evident. Measurements made at the

supplemental sites, which are the most indicative of plant-origin effects, are discussed separately in this section.

Analysis of the distribution of the monthly means of deposition for the native sites of three of the predominant cations (sodium, potassium, and calcium) in the drift indicates that statistically different groups can be identified. Table 5-4 presents an analysis of the annual deposition (means ± standard errors) of these cations for each native site. For sodium, the deposition at site 81 was significantly greater (approximately 56 pounds per acre per year) than at all other native sites; offsite, only site 19 showed somewhat elevated sodium deposition. The analyses for calcium indicate that the annual deposition at site 80 was significantly greater than that of any of the other sites. Site 80 is about 1500 feet southwest of the Water Reclamation Facility and west-southwest of the sludge landfill, and it is probably affected by the lime-drying and handling activities and the associated vehicular traffic at those locations. Similarly, sites 3, 14, 16, 80, 81, 82, and 83, which had significantly higher calcium deposition than most other sites, are also in the vicinity of the sludge landfill. The annual deposition of potassium was significantly greater at sites 20 and 81 than at any other sites.

Figures 5-5 and 5-6 provide the mean monthly deposition for the four supplemental sites. Both sodium and chloride had maximum deposition rates in January. Both showed an overall decrease through the year. Potassium, calcium, and magnesium displayed similar decreases through the year but had peaks in March and November. No abnormal meteorological trends were evident in January that would account for this behavior. As shown in Figure 4-1, the combined nominal drift was at a maximum in September, and the power level was at the maximum for the year in July. The drift rate and power level were slightly lower than these maxima in August.

Table 5-5 presents the annual deposition (means ± standard errors) for all ions and for TSS for all native sites except the four supplemental sites, for all onsite monitoring locations except the supplemental sites, and for the four supplemental sites alone. Drift from the cooling towers should be most evident at the supplemental sites, which are close to the cooling towers (see Section 2.3). The annual mean deposition of sodium, calcium, and magnesium

at the supplemental sites was significantly higher than at all other native sites and onsite locations. Chloride deposition was also much higher at the supplemental sites than at the other native sites and onsite locations. However, statistics for significant difference were not generated for chloride because more than 25 percent of the data for all the other native sites were below detection. Table 5-5 shows rather large differences for sodium, chloride, calcium, and TSS between the values for sites 80-83 and those at other onsite locations.

5.2.2.3 Agricultural Versus Native Paired Control Sites

The salt deposition monitoring network includes two sets of neighboring agricultural and native control sites. The purpose of the control sites is to measure natural background levels and distributions of ionic deposition at distances unlikely to be affected by PVNGS cooling tower emissions. These paired sites are sites 25 and 40, approximately 20 miles northwest of PVNGS, and sites 42 and 43, approximately 15 miles southeast; sites 25 and 43 are the agricultural sites.

Table 5-6 presents the annual deposition of measured ions and TSS for each control site. Statistics showing significant differences for potassium, nitrate, phosphate, ammonium, chloride, and TSS were not computed for this table because more than 25 percent of the data for each analyte were below the detection limit. A comparison of these sites shows that magnesium deposition at sites 25 and 43 (the agricultural sites) and site 40 (native) was significantly higher than that at site 42 (native), and that calcium deposition at sites 25 and 43 also significantly exceeded that at site 42.

Sodium deposition at site 43 was significantly higher than that at the other three control sites.

5.2.2.4 Ion Ratios

The analyses of cooling tower basin water provide concentrations of ions present in the drift emitted from the towers. The drift should preserve the proportions of most of these constituents. A comparison of ratios of these constituents in the deposition samples with those in the drift should provide

an indication of the contribution of the drift to the measured deposition rates at any location.

Table 5-7 presents the ratios of the average values for agricultural and native locations for sodium to potassium, sodium to calcium, sodium to magnesium, and sodium to nitrate. The native sites are broken down into three groups: all-native, onsite (less supplemental), and supplemental. Onsite locations in the comparison include sites 1-6, 10, 14, 16, 20, and 27. The corresponding weighted average ratios for cooling tower water composition for 1991 are also included in Table 5-7 for comparison. The ratios for the monitoring site measurements were fairly consistent between the all-native and onsite groups. The supplemental sites had larger ratios than all other site groups. However, the ratios for all sites were much lower than those observed in the cooling tower circulating water.

5.2.3 Conclusions

From analyses of the salt deposition data for the report period, the following primary conclusions can be drawn (refer to Section 9.2 for the relationship of these conclusions to cooling tower operation):

1. In 1991, increased deposition of sodium was clearly detectable both onsite and at offsite native (site 19) and agricultural (sites 23 and 30) locations.

2. Agricultural sites showed significantly higher average deposition than native sites (except for sodium and chloride) (Table 5-2), even when the supplemental onsite locations near the cooling towers were included in the latter set. This was evident for the mean of all sites, including the paired control sites (Table 5-6). The sum of mean measured ion deposition rates totaled approximately 59 and 44 pounds per acre per year for the agricultural and native sites, respectively.

   The deposition rate for sodium for the native sites was significantly higher than for the agricultural sites with or without the supplemental sites included in the calculation; however, sodium

deposition at offsite native locations was less than that for the agricultural sites.

3. Characteristic of all sites was a great variability in monthly measurements of most ions and TSS. The exact pattern varied with the ion.

4. The deposition rates of two of the three predominant cations (calcium and potassium) were significantly higher at site 23 than those at all other agricultural sites (Table 5-3). The highest mean annual sodium deposition rate measured at any agricultural site was approximately 12 pounds per acre per year at site 23, about 2 miles southwest of the Unit 2 cooling towers and at site 30, about 3.9 miles south-southwest of the Unit 2 cooling towers. No other geographic trends were evident for agricultural sites.

5. The supplemental sites nearest the cooling towers average considerably higher mean salt deposition rates for sodium, potassium, calcium, magnesium, and chloride than all other native sites (Table 5-5). However, sites 20 and 81 showed significantly higher deposition rates of sodium (43 and 56 pounds per acre, respectively) than all the other native sites (Table 5-4). These same two sites also showed a significantly higher deposition rate of potassium (6 pounds per acre per year) than all other native sites.

6. Increased average salt deposition rates and higher ion ratios (Table 5-7) were generally observed at the onsite and supplemental sites. A comparison of these parameters with ratios for all native and agricultural sites clearly evidenced the presence of drift from the PVNGS cooling tower operation, particularly at the supplemental sites. Section 9 presents a more detailed assessment of these data in comparison with predictions and with those parameters measured during the preoperational period.

Table 5-1. Detectability of drift constituents at PVNGS, 1991

Constituent	Laboratory detection limit (mg/L)	Minimum detectable deposition rate (lb/(acre)(yr))*	Percentage of analyses below detection limit
Sodium, total	0.1	1.8	11.8
Potassium, total	0.1	1.8	31.0
Calcium, total	0.1	1.8	1.1
Magnesium, total	0.05	0.9	22.8
Chloride	0.3	5.4	38.1
Fluoride	0.5	9.0	100.0
Sulfate	1.0	18.0	88.4
Nitrate (as N)	0.05	0.9	57.6
Phosphate (as P)	0.02	0.36	82.9
Carbonate	5.0	†	99.8
Bicarbonate	5.0	90.0	81.4
Ammonium (as N)	0.2	3.6	87.9
TSS (at 105°C)	5.0	90.0	28.3
Copper, total	0.1	‡	99.0

Key: TSS, total suspended solids.

*Determined for standard sample volume of 3000 milliliters for rinse water and remaining collector water each month, normalized to 1 year.

†Based on pH.

‡Total mass determined only.

Table 5-2. Deposition (lb/(acre)(yr)) of drift constituents at all PVNGS agricultural and native monitoring sites, January 1-December 31, 1991 (means ± standard errors)

Constituent	Agricultural sites	Native sites	Ratio, agricultural to native sites
Sodium	6.3 ± 0.4	10.7 ± 0.7	0.6 ± 0.05
Potassium	6.2 ± 0.5	2.8 ± 0.1	2.2 ± 0.19
Calcium	24.9 ± 2.1	11.5 ± 0.3	2.2 ± 0.19
Magnesium	6.6 ± 0.7	2.5 ± 0.1	2.6 ± 0.29
Nitrate (as N)	1.4 ± 0.1	1.4 ± 0.1	1.0 ± 0.10
Phosphate (as P)	1.0 ± 0.2	0.3 ± 0.03	3.3 ± 0.74
Ammonium (as N)	4.4 ± 0.5	2.6 ± 0.1	1.7 ± 0.20
Chloride	7.9 ± 0.5	12.1 ± 0.7	0.7 ± 0.06
TSS	568.3 ± 51.7	230.5 ± 6.3	2.5 ± 0.24

Key: TSS, total suspended solids.

Table 5-3. Deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS agricultural sites, 1991 (means ± standard errors)

Site	Sodium	Potassium	Calcium
7	4.1 ± 0.5[ab]	2.0 ± 0.3[a]	12.2 ± 1.2[ab]
11	6.1 ± 0.7[abc]	3.7 ± 0.5[ab]	13.8 ± 1.8[ab]
12	8.8 ± 1.9[cd]	9.2 ± 2.0[c]	15.4 ± 1.7[ab]
13	6.4 ± 1.0[bc]	7.3 ± 2.2[bc]	22.1 ± 5.1[abc]
23	11.5 ± 1.5[d]	22.4 ± 3.6[d]	95.0 ± 14.5[d]
24	4.4 ± 0.4[ab]	2.9 ± 0.6[a]	10.8 ± 1.3[a]
25	3.1 ± 0.3[a]	3.8 ± 0.6[ab]	14.9 ± 2.0[ab]
28	4.1 ± 0.8[ab]	3.1 ± 0.7[ab]	17.7 ± 2.1[ab]
30	11.6 ± 3.0[d]	9.9 ± 1.8[c]	39.6 ± 9.7[c]
31	4.3 ± 0.6[ab]	2.6 ± 0.5[a]	14.9 ± 4.8[ab]
32	6.9 ± 1.1[bc]	7.1 ± 1.9[bc]	27.6 ± 9.5[bc]
43	8.1 ± 0.6[c]	4.8 ± 0.5[ab]	18.7 ± 2.0[ab]
45	4.4 ± 0.6[ab]	3.1 ± 0.3[ab]	24.1 ± 2.6[abc]

Key: For each ion, values with same superscript letter are <u>not</u> significantly different at 95-percent confidence level.

Table 5-4. Deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, 1991 (means ± standard errors)

Site	Sodium	Potassium	Calcium
1*	10.3 ± 1.3[abc]	2.4 ± 0.3[abcdefg]	10.5 ± 0.8[abcde]
2*	9.3 ± 1.2[ab]	3.0 ± 0.5[bcdefgh]	9.9 ± 0.9[abcde]
3*	11.7 ± 1.3[abc]	3.3 ± 0.4[cdefgh]	16.3 ± 1.1[ghi]
4*	6.8 ± 0.7[a]	4.8 ± 1.0[ij]	10.5 ± 0.8[abcde]
5*	6.4 ± 0.8[a]	2.8 ± 0.7[abcdefgh]	8.6 ± 0.7[abcd]
6*	7.6 ± 0.7[ab]	2.4 ± 0.3[abcdefg]	10.3 ± 0.9[abcde]
8	5.8 ± 0.6[a]	2.1 ± 0.3[abcde]	9.3 ± 0.9[abcde]
9	8.1 ± 1.1[ab]	2.8 ± 0.3[abcdefgh]	11.7 ± 0.7[cdef]
10*	7.4 ± 0.9[ab]	1.9 ± 0.2[abc]	10.4 ± 0.9[abcde]
14*	16.1 ± 2.3[bcd]	3.6 ± 0.6[fghi]	19.9 ± 1.9[hij]
15	3.9 ± 0.5[a]	2.1 ± 0.2[abcde]	9.9 ± 0.9[abcde]
16*	19.2 ± 4.1[cd]	2.8 ± 0.4[abcdefgh]	13.2 ± 1.2[efg]
17	4.8 ± 0.7[a]	1.8 ± 0.2[ab]	8.5 ± 1.7[abcd]
18	7.5 ± 1.2[ab]	2.1 ± 0.2[abcde]	8.1 ± 0.9[abcd]
19	10.1 ± 1.5[abc]	3.6 ± 0.6[fghi]	12.4 ± 1.8[defg]
20*	42.8 ± 9.4[f]	5.7 ± 1.5[j]	10.3 ± 1.0[abcde]
21	5.7 ± 0.7[a]	2.6 ± 0.4[abcdefgh]	9.5 ± 0.8[abcde]
22	4.1 ± 0.6[a]	1.9 ± 0.1[ab]	8.3 ± 0.6[abcd]
26	4.8 ± 0.8[a]	2.1 ± 0.4[abcdef]	8.9 ± 0.9[abcde]
27*	5.3 ± 0.7[a]	2.1 ± 0.2[abcde]	7.9 ± 0.7[abcd]
33	3.9 ± 0.6[a]	3.0 ± 0.6[bcdefgh]	10.4 ± 0.7[abcde]
34	4.0 ± 0.6[a]	2.4 ± 0.5[abcdefg]	8.0 ± 0.8[abcd]
35	4.0 ± 0.6[a]	3.4 ± 0.4[efghi]	9.8 ± 0.8[abcde]
36	3.3 ± 0.6[a]	1.9 ± 0.2[abcd]	7.1 ± 0.8[ab]
37	3.6 ± 0.7[a]	2.0 ± 0.2[abcde]	6.1 ± 0.7[a]
38	3.5 ± 0.7[a]	1.7 ± 0.2[ab]	10.3 ± 2.2[abcde]
39	4.2 ± 0.9[a]	1.9 ± 0.2[ab]	8.0 ± 0.8[abcd]
40	3.4 ± 0.6[a]	3.6 ± 0.5[ghi]	11.0 ± 0.9[bcde]
41	5.5 ± 0.8[a]	1.9 ± 0.2[abcd]	9.2 ± 0.8[abcde]
42	3.6 ± 0.8[a]	1.5 ± 0.1[a]	7.6 ± 0.8[abc]
44	3.5 ± 0.4[a]	2.4 ± 0.3[abcdefg]	8.7 ± 0.8[abcd]
80*	25.1 ± 4.3[de]	3.9 ± 0.7[hi]	33.4 ± 6.8
81*	56.3 ± 13.4[g]	5.5 ± 1.0[j]	20.4 ± 1.7[ij]
82*	21.3 ± 3.5[de]	3.4 ± 0.4[efghi]	15.8 ± 2.2[fgh]
83*	28.8 ± 5.1[e]	3.3 ± 0.4[defghi]	22.7 ± 1.7[j]

Key: For each ion, values with same superscript letter are <u>not</u> significantly different at 95-percent confidence level.

*Onsite location.

Table 5-5. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS native sites, 1991 (means ± standard errors)

Constituent	All native sites (except 80-83)	All onsite sites* (except 80-83)	Sites 80-83
Sodium	7.7 ± 0.5	13.0 ± 1.2	32.9 ± 4.0
Potassium†	2.6 ± 0.1	3.2 ± 0.2	4.0 ± 0.3
Calcium	10.0 ± 0.2	11.6 ± 0.4	23.1 ± 2.0
Magnesium	2.2 ± 0.1	2.5 ± 0.1	4.7 ± 0.4
Nitrate (as N)†	1.2 ± 0.1	1.6 ± 0.1	2.7 ± 0.4
Phosphate (as P)†	0.3 ± 0.03	0.3 ± 0.1	0.3 ± 0.1
Ammonium (as N)†	2.6 ± 0.1	2.9 ± 0.4	2.7 ± 0.3
Chloride†	9.1 ± 0.5	14.3 ± 1.2	35.0 ± 4.2
TSS†	213.0 ± 5.9	226.3 ± 9.2	364.1 ± 28.1

Key:

1. All ions for which difference statistics were generated are significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*Sites 1-6, 10, 14, 16, 20, and 27.

†Difference statistics were not generated because of the high percentage of data below the detection limit.

Table 5-6. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural and native control sites, 1991 (means ± standard errors)

Constituent	Agricultural sites 25	Agricultural sites 43	Native sites 40	Native sites 42
Sodium	3.1 ± 0.3[a]	8.1 ± 0.6	3.4 ± 0.6[a]	3.6 ± 0.8[a]
Potassium†	3.8 ± 0.6	4.8 ± 0.5	3.6 ± 0.5	1.5 ± 0.1
Calcium	14.9 ± 2.0[bc]	18.7 ± 2.0[c]	11.0 ± 0.9[ab]	7.6 ± 0.8[a]
Magnesium	4.7 ± 1.1[b]	4.7 ± 0.7[b]	3.3 ± 0.3[ab]	1.6 ± 0.2[a]
Nitrate (as N)†	0.8 ± 0.1	1.2 ± 0.3	0.6 ± 0.05	0.9 ± 0.1
Phosphate (as P)†	0.4 ± 0.1	0.6 ± 0.1	0.2 ± 0.01	0.2 ± 0.05
Ammonium (as N)†	2.2 ± 0.2	4.7 ± 1.1	2.4 ± 0.2	1.9 ± 0.1
Chloride†	4.8 ± 0.5	10.7 ± 1.1	4.8 ± 0.6	5.5 ± 0.9
TSS†	432.9 ± 109.4	407.8 ± 62.7	352.2 ± 43.0	153.1 ± 18.9

Key: 1. For each ion, means with same superscript letter are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

†Difference statistics were not generated because of the high percentage of data below the detection limit.

Table 5-7. Ratios of ionic constituents of drift deposition at PVNGS monitoring sites and in cooling tower basin water, 1991

Ratio	Drift deposition: All agricultural sites	All native sites*	Onsite sites†	Supplemental sites	Cooling tower basin water‡
Sodium/potassium	1.0	3.8	4.1	8.2	21.1
Sodium/calcium	0.3	0.9	1.1	1.4	19.5
Sodium/magnesium	1.0	4.3	5.2	7.0	270.9
Sodium/nitrate	4.5	7.6	8.1	12.2	21.9

*Includes onsite and supplemental sites.

†Sites 1-6, 10, 14, 16, 20, and 27.

‡Weighted average based on number of months of operations for Units 1-3.

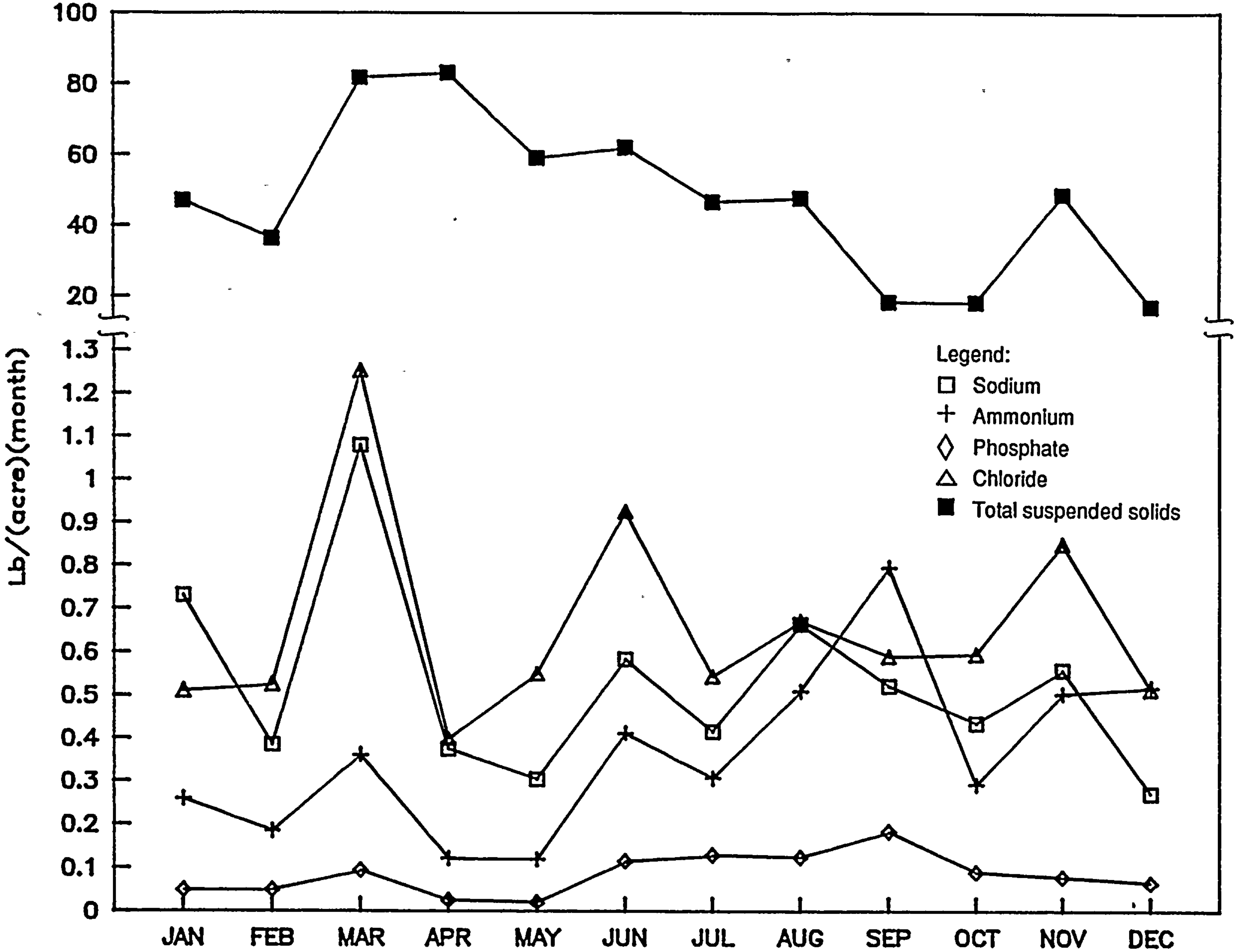

Figure 5-1. Mean monthly deposition of total suspended solids, sodium, ammonium, phosphate, and chloride at PVNGS agricultural monitoring sites, 1991

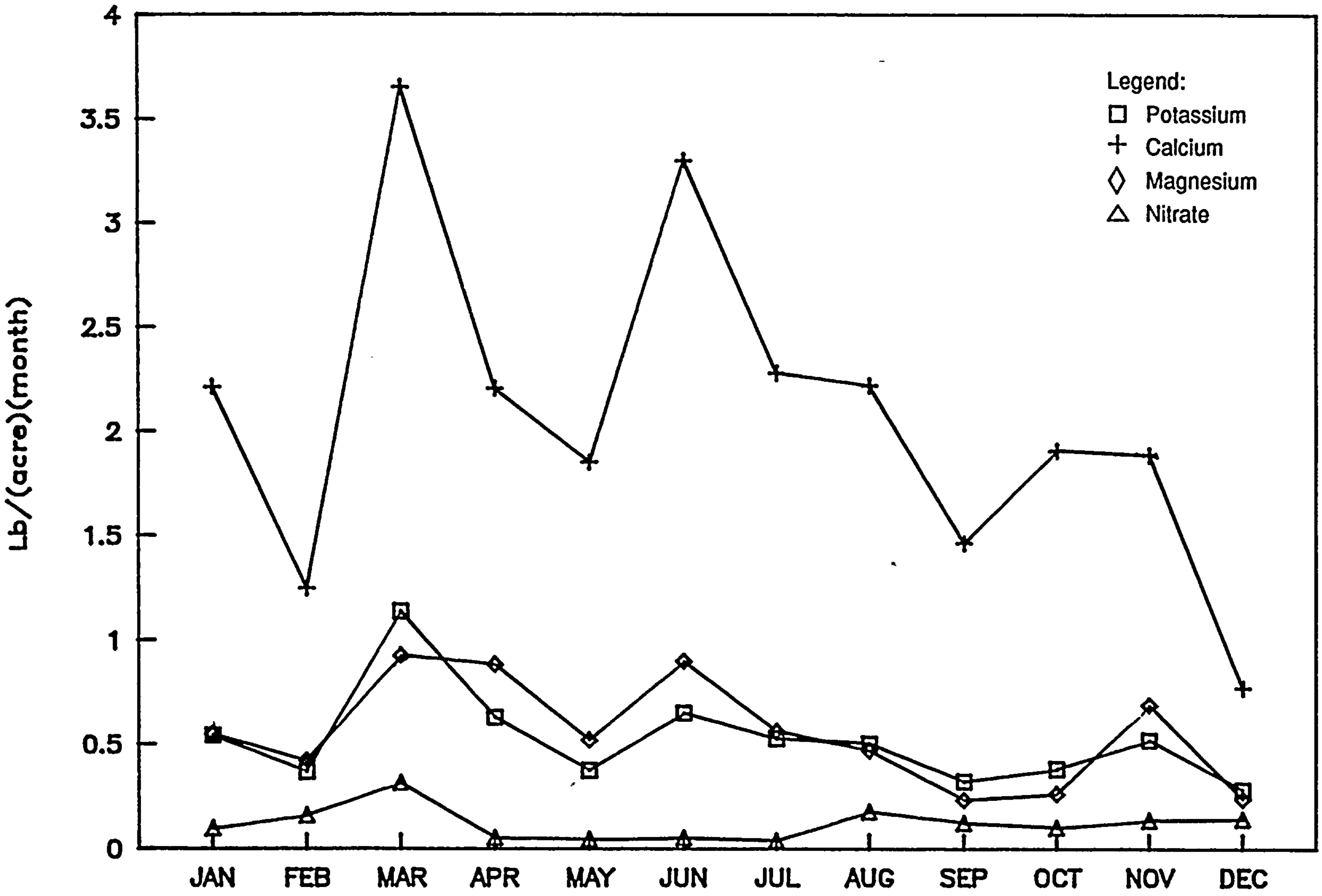

Figure 5-2. Mean monthly deposition of potassium, calcium, magnesium, and nitrate at PVNGS agricultural monitoring sites, 1991

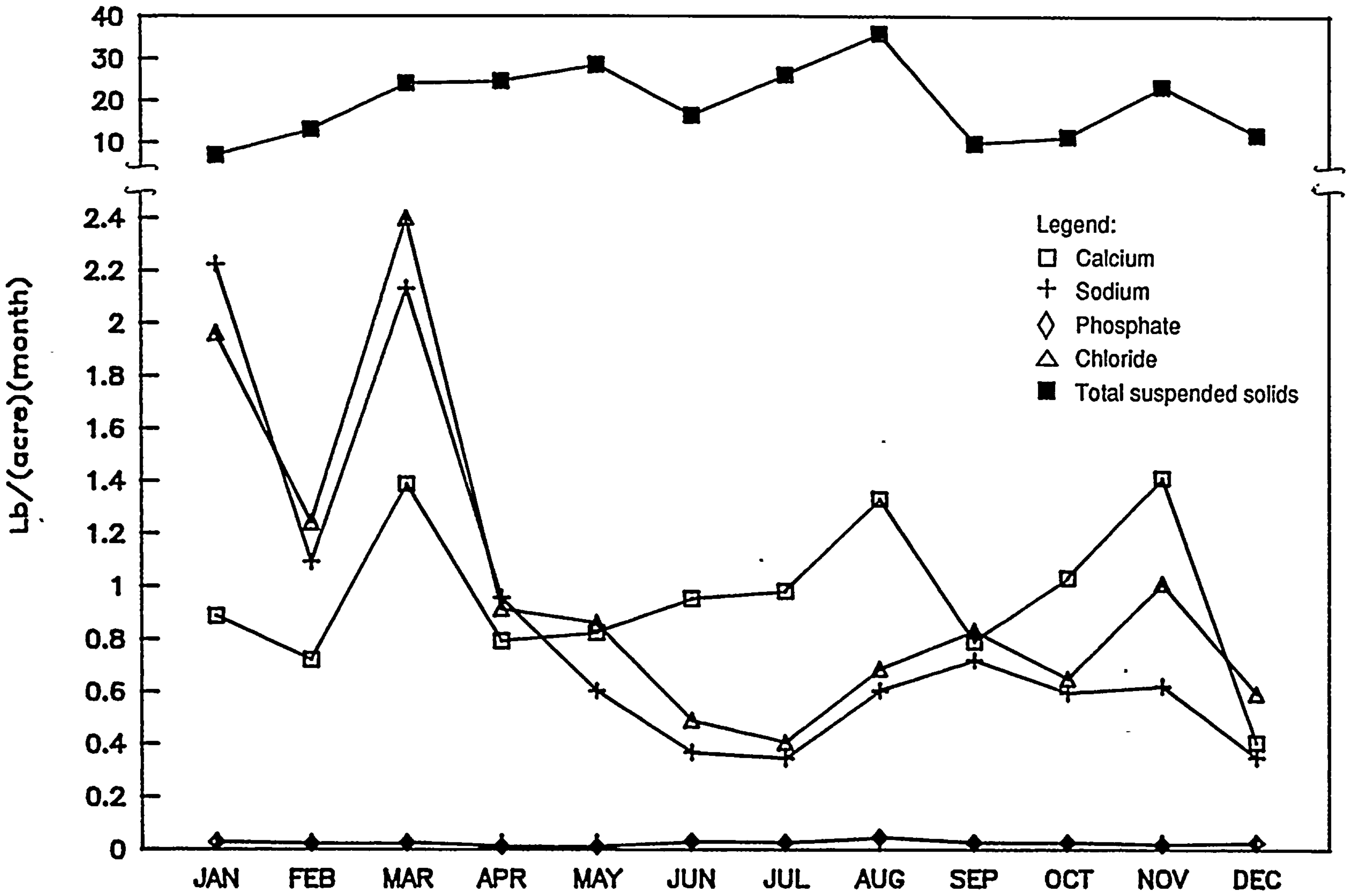

Figure 5-3. Mean monthly deposition of total suspended solids, calcium, sodium phosphate, and chloride at PVNGS native monitoring sites, 1991

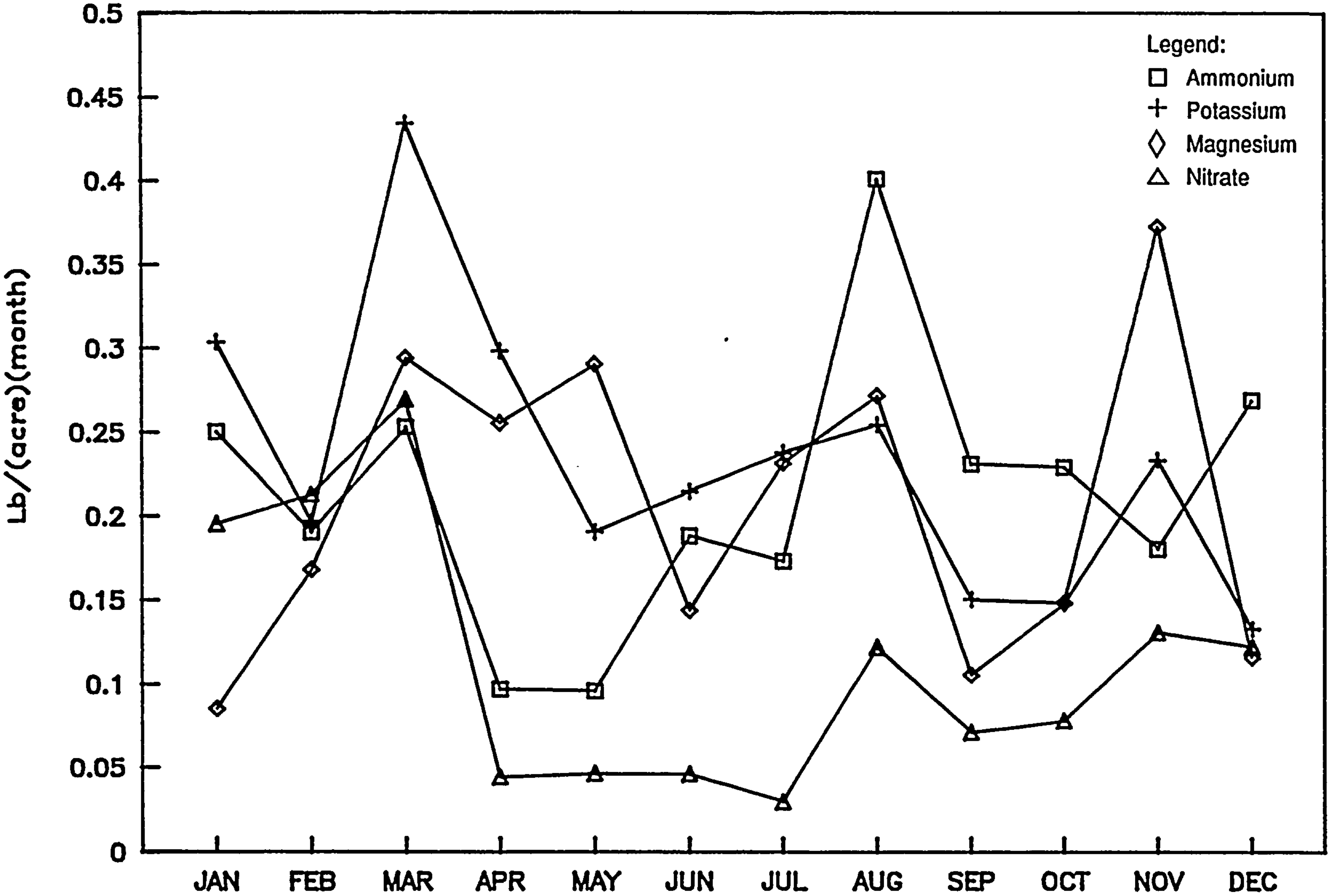

Figure 5-4. Mean monthly deposition of ammonium, potassium, magnesium, and nitrate at PVNGS native monitoring sites, 1991

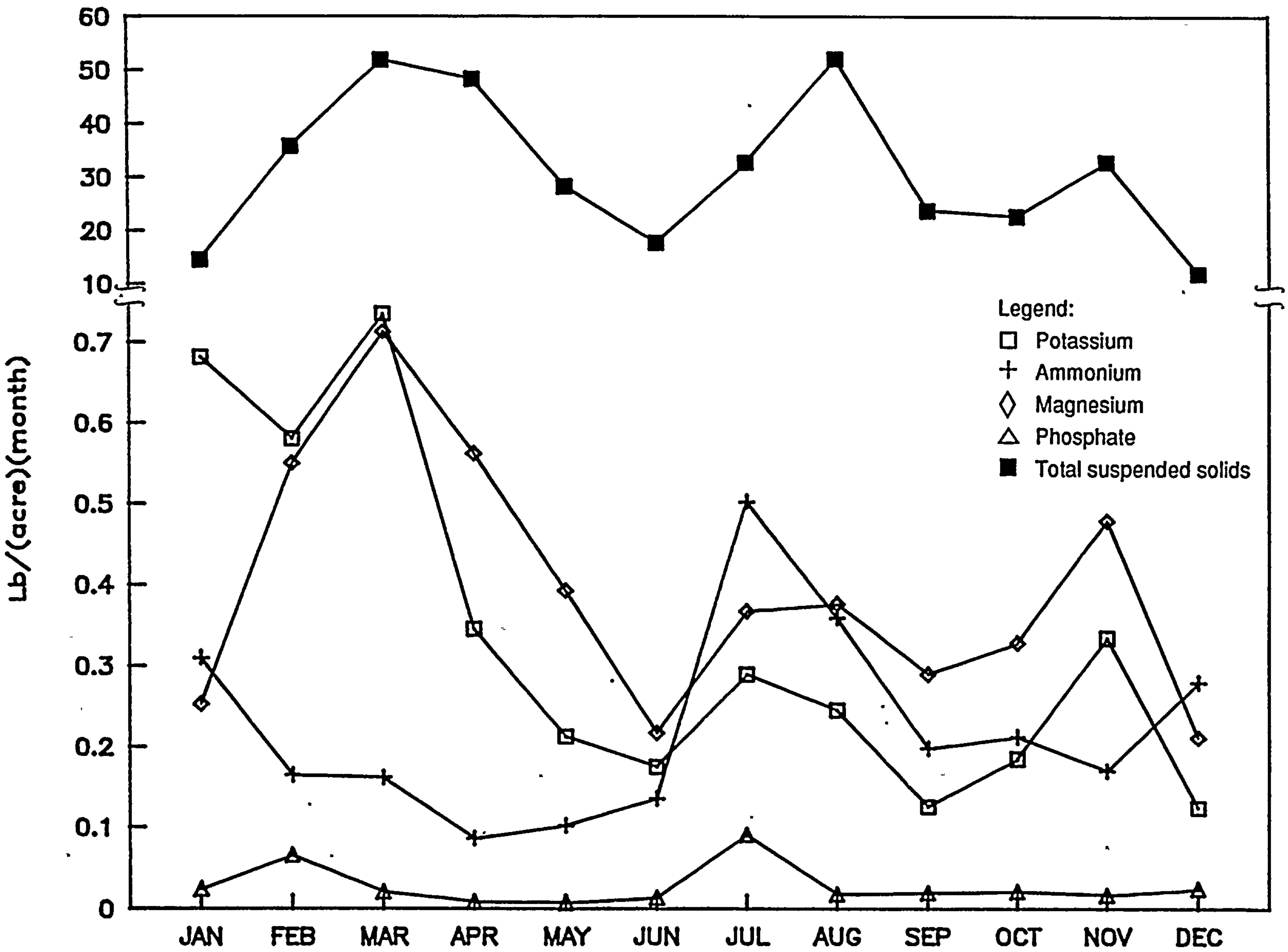

Figure 5-5. Mean monthly deposition of total suspended solids, potassium, ammonium, magnesium, and phosphate at PVNGS supplemental monitoring sites, 1991

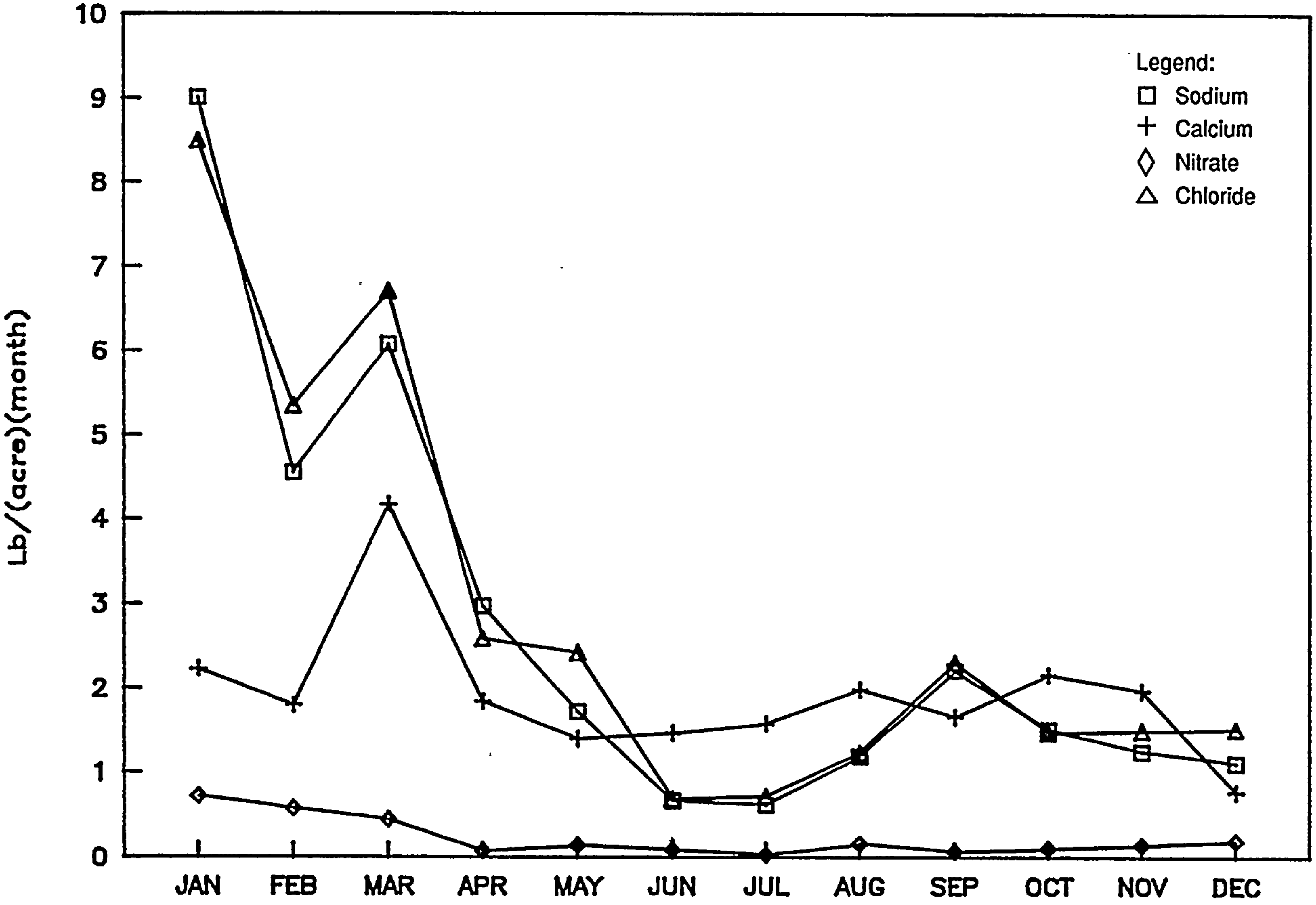

Figure 5-6. Mean monthly deposition of sodium, calcium, nitrate, and chloride at PVNGS supplemental monitoring sites, 1991

6 Analyses of Agricultural Crops and Native Vegetation

6.1 CONCENTRATION OF SELECTED IONS IN LEAF TISSUE

Vascular plants require several nutrients for normal metabolic growth and acquire these from the air, water, and soil. The processes involved in the transport of a nutrient ion from the soil environment into the root and its translocation and distribution within the plant are complex and interrelated (Foth and Turk, 1972). The approach used here for evaluating the influence of cooling tower drift deposition on surrounding agricultural crops and indigenous flora is to identify and analyze ionic concentrations in cooling tower basin water and drift, and to simultaneously monitor the same ionic concentrations in agricultural and indigenous leaf phytomass over time.

Leaf phytomass was sampled twice at each monitoring site in 1991: agricultural phytomass was taken during the middle (early July) and end (late August) of the growing season, and native phytomass was sampled during March and October. At each site a minimum of 20 grams wet weight of leaf tissue was collected from 10 plots each season. One split sample was taken at each site to evaluate laboratory accuracy. Leaf phytomass was analyzed for concentrations of four cations (sodium, potassium, calcium, and magnesium) and five anions (chloride, sulfate, nitrate, phosphate, and fluoride), and results were reported in micrograms per gram dry weight (parts per million).

The results of chemical analyses of leaf phytomass sampled during 1991 are presented in Appendices D (native vegetation) and E (agricultural crops). Statistical analysis included factorial and one-way analyses of variance (ANOVAs) in a completely randomized design. For the factorial ANOVA, main effects included location and year. The following sections summarize these analyses, as well as analyses of cotton yield and the structure of native vegetation. Differences between means were identified by using the least-significant-difference multiple range test. Unless stated otherwise, differences are reported as significant when the probability is less than .05 (i.e., at the 95-percent confidence level). A comparison of the 1991 concentrations with preoperational (1983-1985) concentrations is given in Chapter 9.

6.1.1 Agricultural Crops

During the 1991 growing season, sites 7, 11, 24, 25, 28, 31, 32, and 45 were fallow (Figure 2-2). Of the remaining sites, two (sites 23 and 43) were planted in alfalfa and three (sites 12, 13, and 30) in short-staple (i.e, upland) cotton. Long-staple (i.e., Pima) cotton was not planted at any of the sites in 1991.

6.1.1.1 Alfalfa

Sites 23 and 43 contained alfalfa in 1991. The results of the leaf tissue analyses are presented in Table 6-1. Site 23 is located about 2 miles south-southwest of the PVNGS while site 43, a control site, is about 15 miles south-southeast of PVNGS (Figure 2-2).

Mean concentrations of sodium, chloride, and phosphate were significantly higher at site 43 than at site 23. Mean concentrations of potassium, calcium, and fluoride were significantly higher at site 23 than at site 43. There was no significant difference between the sites in the mean concentrations of magnesium, sulfate, and nitrate.

6.1.1.2 Cotton

Three agricultural monitoring sites containing short-staple cotton (sites 12, 13, and 30) were sampled during the 1991 growing season. This was the first time since 1985 that monitoring site 12 was planted with short-staple cotton. It was also the first year since the study was initiated that site 11 was fallow.

The mean concentrations of analytes for short-staple cotton are presented in Table 6-2. Mean concentrations of sodium and chloride were significantly higher at site 13 than at sites 12 and 30. There was no significant difference between any of the sites in the mean concentrations of potassium, sulfate, nitrate, phosphate, and fluoride. Calcium levels at site 12 were not significantly different from those at sites 13 and 30; however, the mean concentration at site 30 was significantly higher than that at site 13.

Magnesium levels were significantly different at each site, with site 12 having the lowest value and site 30 the highest.

6.1.2 Native Vegetation

6.1.2.1 Creosote Bush

The ionic content of creosote bush (Larrea divaricata) leaf tissue was measured at five locations in 1991; results are summarized in Table 6-3. Sites 1, 4, and 6 are on PVNGS; sites 40 and 42, which serve as controls, are approximately 18 miles west-northwest and 17 miles south-southeast, respectively, of the station (Figure 2-2).

The mean concentration of sodium was significantly higher at sites 1 and 4 than at sites 6, 40, and 42. Potassium levels were significantly higher at site 4 than at site 6; values at both of these sites were significantly higher than at sites 1, 40, and 42. The mean concentration of calcium was significantly higher at sites 1, 6, and 42 than at sites 4 and 40. Magnesium levels fell into two overlapping groups that were significantly different. The mean ionic concentration of magnesium was significantly higher for the group containing sites 1, 6, 40, and 42 than for the group containing sites 1, 4, and 40. Chloride levels were significantly higher and lower at sites 6 and 40, respectively, than at the remaining sites. Levels of sulfate were not significantly different at sites 1, 4, 6, and 42; all values for site 40 were below the detection limit. The analysis of mean nitrate concentrations revealed three overlapping groups of sites where analyte levels were significantly different. From lowest nitrate level to highest, the three groups were sites 40 and 42; 1, 6, and 42; and 1, 4, and 6. The mean concentration of phosphate was significantly higher at sites 4, 6, and 40 than at sites 1 and 42. Site 1 had significantly higher levels of fluoride than the remaining sites, whose levels did not differ significantly.

6.1.2.2 Salt Bush

The ionic content of salt bush (Atriplex polycarpa) was measured at three monitoring sites in 1991; results are summarized in Table 6-4. Monitoring

sites 2 and 3 are on PVNGS, whereas site 44, which serves as a control, lies approximately 6 miles northwest (Figure 2-2).

Sodium concentrations were significantly different at each site, with site 44 having the lowest value and site 3 the highest. Mean concentrations of potassium, calcium, nitrate, and phosphate were not significantly different at any of the sites. Levels of magnesium were significantly higher at site 44 than at sites 2 and 3. Conversely, levels of chloride were significantly lower at site 44 than at sites 2 and 3. Sulfate levels at site 44 were not significantly different from sites 2 and 3; however, the mean concentration at site 2 was significantly higher than at site 3. The mean concentration of fluoride was significantly higher at site 2 than at sites 3 and 44.

6.2 COTTON YIELD

The mean yield of short-staple cotton in 1991 ranged from 2,135 pounds per acre at monitoring site 30 to 3,583 pounds per acre at site 13. Long-staple cotton was not planted at any of the monitored fields in 1991. These results and a comparison of the 1991 harvest with those of 1983-1985 are discussed in greater detail in Section 9.3.

6.3 STRUCTURE OF NATIVE PLANT COMMUNITIES

Species composition, relative cover, and diversity were quantitatively monitored in eight native plant communities on or in the vicinity of PVNGS in 1991 (Figure 2-2). Ten 1- by 10-meter plots were sampled during March and October within each community. Cover refers to the percentage of a line intersected by a given species; it is a measure of plant biomass. Two components of diversity were considered. The first, richness, refers to the number of species sampled from the community. The second, heterogeneity, incorporates both richness and equitability or evenness (Shannon and Weaver, 1949). Floristic nomenclature, which had followed Kearney and Peebles (1973), was updated in the 1989 Annual Report using Lehr (1978), Lehr and Pinkava (1980, 1982), and Turner (1986). The updated nomenclature is presented in Table 6-5, which also lists all native vegetation observed to date. Except where noted, scientific names within the text and tables have

not been changed in order to facilitate a comparison of this annual report with previous reports.

6.3.1 Creosote Bush

A comparison of the species composition, cover, and floristic diversity of five creosote bush communities is presented in Table 6-6. Monitoring sites 1, 4, and 6 are on PVNGS; control sites 40 and 42 are approximately 18 miles west-northwest and 17 miles south-southeast, respectively, from PVNGS (Figure 2-2).

Creosote bush was the dominant species at each of the five sites during both the spring and fall sampling periods; it characterized most of the native vegetation near PVNGS. Relative cover for this species ranged from 10.5 percent at site 4 to 15.0 percent at site 6. Percent cover values for the control sites were within the range of values of the onsite sample locations. Herbs and grasses were recorded primarily in the spring. Woolly plantain (Plantago insularis) was the dominant vascular herbaceous species in 1991. Based on the cumulative total coverage six weeks three-awn (Aristida adscensionis) was the dominant grass in 1991. However, Mediterranean grass (Schismus barbatus) was more evenly distributed across the five sample sites. Four species of cacti were observed in 1991; site 4 supported the greatest abundance and diversity.

Species richness within each of the five plant communities in 1991 ranged from 8 to 24. A cumulative total of 43 species was observed in 1991. Monitoring site 6 showed the greatest richness, and it was followed in order by sites 1, 4, 42, and 40. Plant communities at PVNGS had species richness values that were higher than those of the control sites. Compared with 1990 data, heterogeneity increased at sites 1, 4, and 6 in 1991; at sites 40 and 42 heterogeneity decreased. As was the case with species richness, onsite plant communities had higher heterogeneity values than the control sites.

6.3.2 Salt Bush

Three salt bush (Atriplex spp.) communities were measured in 1991. Sites 2 and 3 are on PVNGS, while site 44, a control, is about 6 miles northwest of the station. Salt bush communities, which are fairly uncommon in the

vicinity of PVNGS, were characterized by species of flora different from those in the creosote bush communities. Some species, however, were common to both communities.

Five species of perennial shrubs were identified from the three communities in 1991 (Table 6-7). Salt bush (*Atriplex polycarpa*) was the dominant perennial shrub in each of the communities. A second species of salt bush (*Atriplex linearis*) was present at sites 2 and 3, but it occurred much less frequently. More species of perennial shrubs were observed at monitoring site 2 than at sites 3 and 44. The dominant herbaceous species was woolly plantain (*Plantago insularis*), which was recorded exclusively during the spring sampling period. Mediterranean grass (*Schismus barbatus*) was the dominant grass; no cacti were observed.

Site 2 showed the greatest species richness and site 44 the lowest. This pattern was also observed with respect to heterogeneity. The salt bush communities had a greater number of species of perennial shrubs than the creosote bush communities, but the creosote bush communities had more herbaceous species. A comparison of community structure in the preoperational and operational periods is presented in Section 9.3.2.

Table 6-1. Ion content (µg/g dry weight) of alfalfa leaf tissue at PVNGS agricultural monitoring sites 23 and 43, 1991 (means ± standard errors)

Ion	Monitoring Site	
	23	43
Sodium	709 ± 46	1,705 ± 98
Potassium	23,432 ± 1,168	20,761 ± 410
Calcium	22,123 ± 1,734	15,041 ± 766
Magnesium	2,696 ± 43[a]	2,683 ± 77[a]
Chloride	10,800 ± 327	16,270 ± 371
Sulfate	10,694 ± 482[a]	10,233 ± 707[a]
Nitrate (as N)	107 ± 16[a]	97 ± 17[a]
Phosphate (as P)	2,066 ± 81	2,564 ± 64
Fluoride	14.4 ± 0.6	11.5 ± 0.5

Key: For individual ions, means with the same superscript letter are not significantly different at the 95-percent confidence level.

Note: All values were derived from analysis of 20 samples at each site.

Table 6-2. Ion content (µg/g dry weight) of short-staple cotton leaf tissue at PVNGS monitoring sites, 1991 (means ± standard errors)

Ion	Monitoring site		
	12	13	30
Sodium	2,726 ± 433[a]	4,168 ± 462	2,128 ± 82[a]
Potassium	25,464 ± 929[a]	23,770 ± 788[a]	26,539 ± 690[a]
Calcium	43,340 ± 1,538[ab]	41,720 ± 932[a]	45,938 ± 731[b]
Magnesium	4,442 ± 93	5,026 ± 200	6,211 ± 178
Chloride	20,190 ± 383[a]	24,140 ± 530	19,740 ± 336[a]
Sulfate	40,762 ± 3,033[a]	43,000 ± 2,144[a]	45,818 ± 2,694[a]
Nitrate (as N)	1,069 ± 206[a]	864 ± 142[a]	1,219 ± 247[a]
Phosphate (as P)	2,445 ± 99[a]	2,058 ± 132[a]	2,299 ± 106[a]
Fluoride	16.0 ± 0.8[a]	16.0 ± 0.9[a]	17.8 ± 1.6[a]

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: All values were derived from analysis of 20 samples at each site.

Table 6-3. Ion content (μg/g dry weight) of creosote bush (<u>Larrea divaricata</u>) leaf tissue at PVNGS monitoring sites, 1991 (means ± standard errors)

Ion	Monitoring site 1	4	6	40	42
Sodium	384 ± 30[b]	399 ± 26[b]	275 ± 16[a]	295 ± 15[a]	295 ± 18[a]
Potassium	12,169 ± 386[a]	16,456 ± 620	14,639 ± 464	13,081 ± 401[a]	12,186 ± 505[a]
Calcium	18,155 ± 538[b]	15,212 ± 618[a]	18,864 ± 816[b]	15,451 ± 415[a]	19,065 ± 560[b]
Magnesium	1,442 ± 47[ab]	1,296 ± 45[a]	1,538 ± 87[b]	1,442 ± 56[ab]	1,503 ± 48[b]
Chloride	6,700 ± 256[a]	7,588 ± 400[b]	8,380 ± 208	4,720 ± 230	7,310 ± 254[ab]
Sulfate	2,858 ± 813[a]	4,943 ± 835[a]	4,746 ± 777[a]	--	3,818 ± 489[a]
Nitrate (as N)	118 ± 12[bc]	162 ± 29[c]	124 ± 19[bc]	35 ± 3[a]	76 ± 14[ab]
Phosphate (as P)	1,054 ± 63[a]	1,349 ± 35[b]	1,483 ± 80[b]	1,400 ± 100[b]	1,151 ± 55[a]
Fluoride	31.7 ± 1.7	22.6 ± 1.6[a]	21.6 ± 0.8[a]	20.3 ± 0.5[a]	20.3 ± 0.3[a]

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: Except for sulfate, all site values were derived from analysis of 20 samples. Since some values were below detection limits, sample sizes for sulfate varied. Numbers of sulfate samples were as follows: 9 at site 1; 13 at site 4; 16 at site 6; 0 at site 40; and 10 at site 42.

Table 6-4. Ion content (μg/g dry weight) of salt bush (<u>Atriplex polycarpa</u>) leaf tissue at PVNGS monitoring sites, 1991 (means ± standard errors)

Ion	Monitoring site 2	Monitoring site 3	Monitoring site 44
Sodium	57,372 ± 1,813	65,120 ± 1,465	35,341 ± 1,360
Potassium	21,182 ± 1,181[a]	24,245 ± 1,142[a]	23,601 ± 1,285[a]
Calcium	11,537 ± 675[a]	11,621 ± 862[a]	9,749 ± 468[a]
Magnesium	5,113 ± 217[a]	5,379 ± 252[a]	6,284 ± 240
Chloride	50,640 ± 1,653[a]	54,030 ± 1,970[a]	33,156 ± 1,130
Sulfate	6,132 ± 948[b]	3,418 ± 455[a]	5,028 ± 485[ab]
Nitrate (as N)	140 ± 21[a]	141 ± 13[a]	153 ± 23[a]
Phosphate (as P)	1,320 ± 139[a]	1,261 ± 65[a]	1,270 ± 65[a]
Fluoride	16.6 ± 0.8	13.1 ± 0.4[a]	12.3 ± 0.3[a]

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: All site values were derived from analysis of 20 samples except that for sulfate at sites 2 and 3, which were based on 17 and 18, respectively.

Table 6-5. Indigenous flora at PVNGS, 1983-1991: comprehensive list with updated nomenclature (sheet 1 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Shrubs		
Ambrosia dumosa	White bursage	
Atriplex linearis	Salt bush; narrow-leaved wingscale	*Atriplex canescens* ssp. *linearis*
Atriplex polycarpa	Salt bush; all scale	
Larrea divaricata	Creosote bush; greasewood	*Larrea divaricata* var. *tridentata*
Lycium Fremontii	Fremont thornbush	
Lycium Parishii	Parish thornbush	
Lycium sp.	Wolfberry; desert thorn	
Prosopis velutina	Velvet mesquite	
Herbs		
Abronia villosa	Hairy sand verbena	
Allionia incarnata	Trailing four-o'clock	
Amaranthus fimbriatus	Fringed amaranth	
Amsinckia intermedia	Coast fiddleneck	
Argythamnia neomexicana	None	
Astragalus Nuttallianus	None	
Boerhaavia intermedia	Five-winged ringstem	
Bowlesia incana	Hairy bowlesia	
Brassica Tournefortii	Mustard	
Camelina microcarpa	Little pod	
Camissonia sp.	Evening primrose	
Chaenactis carphoclinia	Pebble pincushion	
Chaenactis Fremontii	Fremont pincushion	
Chorizanthe brevicornu	Brittle spine flower	
Chorizanthe rigida	Rigid spiny herb	
Cryptantha angustifolia	Narrow-leaved cryptantha	

Table 6-5. Indigenous flora at PVNGS, 1983-1991: comprehensive list with updated nomenclature (sheet 2 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Cryptantha inaequata	Darwin cryptantha	
Cryptantha maritima	White-haired cryptantha	
Cryptantha muricata	None	
Cryptantha pterocarya	None	
Cryptantha sp.	None	
Dalea mollis	Silk dalea	
Dalea neomexicana	Indigo bush; pea bush	
Daucus pusillus	American carrot	
Eremalche exilis	None	
Eriastrum diffusum	None	
Erigeron lobatus	Fleabane	
Eriogonum Thomasii	Thomas eriogonum	
Eriogonum trichopes	Little trumpet	
Eriophyllum lanosum	Woolly eriophyllum	
Erodium cicutarium	Filaree; heron bill	
Erodium texanum	Large-flowered stork's bill; heron bill	
Eucrypta chrysanthemifolia	Torrey eucrypta	
Eucrypta micrantha	Small-flowered eucrypta	
Euphorbia capitellata	Spurge	
Euphorbia polycarpa	Small-seeded sand mat	
Euphorbia sp.	Spurge	
Filago arizonica	Arizona filago	
Hesperocallis undulata	Desert lily	
Krameria sp.	Ratany	
Lepidium lasiocarpum	Sand pepper grass	
Lepidium virginicum	Pepper grass; pepperwort	
Lepidium sp.	Pepper grass; pepperwort	

Table 6-5. Indigenous flora at PVNGS, 1983-1991: comprehensive list with updated nomenclature (sheet 3 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Lesquerella Gordoni	Gordon bladderpod	
Linanthus bigelovii	None	
Linanthus dichotomus	Evening snow	
Lotus salsuginosus	Deer vetch	
Lotus tomentellus	Hairy lotus	Lotus strigosus var. tomentellus
Lupinus sparsiflorus	Lupine	Lupinus sparsiflorus ssp. mohavensis
Machaeranthera arida	None	Machaeranthera Coulteri var. arida
Machaeranthera Coulteri	None	Machaeranthera Coulteri var. arida
Monoptilon bellioides	Mohave desert star	
Nama demissum	Purple mat	
Nama hispidum	None	
Nemacladus glanduliferus	Thread plant	
Oenothera sp.	Evening primrose; sun drops	
Oligomeris linifolia	Linear-leaved cambess	
Orthocarpus purpurascens	Mohave owl clover	
Pectis papposa	Chinchweed	
Pectocarya platycarpa	Broad-nutted comb bur	
Perityle Emoryi	Emory rock daisy	
Phacelia crenulata	None	
Pholistoma auritum	None	
Plantago insularis	Woolly plantain, Indian wheat	
Portulaca parvula	Purslane	
Proboscidea altheaefolia	Desert unicorn plant; elephant tusks	
Salsola Kali§	Russian thistle	
Sisymbrium Irio	London rocket	
Spermolepis echinata	Scale seed	

Table 6-5. Indigenous flora at PVNGS, 1983-1991: comprehensive list with updated nomenclature (sheet 4 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Sphaeralcea Coulteri	Coulter globe mallow	
Sphaeralcea sp.	Alkali pink	
Thelypodium lasiophyllum	None	
Tidestromia lanuginosa	Woolly tidestromia	
Trianthema Portulacastrum	Horse purslane	
Grasses		
Aristida adscensionis	Six weeks three-awn	
Aristida sp.	Three-awn	
Bouteloua barbata	Six-weeks grama	
Bromus rubens	Red brome; foxtail chess	
Erioneuron pulchellum	Fluff grass	
Festuca octoflora	Six-weeks fescue	*Vulpia octoflora*
Muhlenbergia microsperma	Littleseed muhly	
Schismus arabicus	Arabian grass	
Schismus barbatus	Mediterranean grass	
Schismus sp.	None	

Table 6-5. Indigenous flora at PVNGS, 1983-1991: comprehensive list with updated nomenclature (sheet 5 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Cacti		
Echinocereus Engelmannii	Hedgehog cactus; strawberry cactus	
Ferocactus Wislizeni	Barrel cactus	
Opuntia acanthocarpa	Buckhorn cholla	
Opuntia echinocarpa	Silver cholla; golden cholla	
Opuntia leptocaulis	Desert Christmas cactus	
Opuntia ramosissima	Diamond cholla	

* From Kearney and Peebles, 1973.

† Updated using Lehr, 1978.

‡ From Lehr, 1978; Lehr and Pinkava, 1980, 1982; and Turner, 1986.

§ Until recently Salsola Kali was the only species of Salsola listed in Arizona; however, there are now two species listed: Salsola iberica and Salsola paulsenii. Future field work may determine if one or both of these species are present within study plots.

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities at PVNGS monitoring sites, 1991 (sheet 1 of 3)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
Species composition and percent cover							
Shrubs							
Ambrosia dumosa*	White bursage†	1.3					1.3
Larrea divaricata	Creosote bush; greasewood	13.0	10.5	15.0	12.1	12.3	62.9
Herbs							
Allionia incarnata	Trailing four-o'clock				<0.1		<0.1
Amsinckia intermedia	Coast fiddleneck	0.1		0.5		<0.1	0.6
Argythamnia neomexicana	None	--					--
Astragalus Nuttallianus	None		0.1	--		<0.1	0.1
Bowlesia incana	Hairy bowlesia	--					--
Camissonia sp.	Evening primrose			--			--
Chaenactis carphoclinia	Pebble pincushion	0.1	<0.1			--	0.1
Chorizanthe brevicornu	Brittle spine flower			0.1		--	0.1
Chorizanthe rigida	Rigid spiny herb		0.1	<0.1			0.1
Cryptantha pterocarya	None	<0.1					<0.1
Daucus pusillus	American carrot	0.8					0.8
Eriogonum trichopes	Little trumpet		0.1	0.1		0.1	0.3
Eriophyllum lanosum	Woolly eriophyllum	--		0.1			0.1
Erodium cicutarium	Filaree; heron bill	0.2		0.1			0.3
Erodium texanum	Large-flowered stork's bill; heron bill	1.3	0.2	<0.1		--	1.5

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities at PVNGS monitoring sites, 1991 (sheet 2 of 3)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
		Species composition and percent cover (continued)					
Herbs (continued)							
Eucrypta chrysanthemifolia	Torrey eucrypta			<0.1			<0.1
Euphorbia polycarpa	Small-seeded sand mat	0.1					0.1
Euphorbia sp.	Spurge			<0.1			<0.1
Hesperocallis undulata	Desert lily		--				--
Lepidium virginicum	Pepper grass; pepperwort	0.3	0.1	0.3	--	0.4	1.1
Lesquerella Gordoni	Gordon bladderpod		0.2		0.1	--	0.3
Linanthus bigelovii	None	<0.1		<0.1			0.1
Lotus tomentellus	Hairy lotus		<0.1	<0.1		0.1	0.1
Lupinus sparsiflorus	Lupine			0.1			0.1
Machaeranthera Coulteri	None			--			--
Pectis papposa	Chinchweed		--	--			--
Pectocarya platycarpa	Broad-nutted comb bur	0.2	0.1	0.8	0.2	0.1	1.4
Phacelia crenulata	None	0.3	<0.1				0.3
Plantago insularis	Woolly plantain; Indian wheat	1.5	2.8	5.6	2.0	4.3	16.2
Sphaeralcea Coulteri	Coulter globe mallow				--		--
Tidestromia lanuginosa	Woolly tidestromia		<0.1				<0.1
Grasses							
Aristida adscensionis	Six weeks three-awn	0.4	0.1	3.7		<0.1	4.2
Bouteloua barbata	Six-weeks grama	0.2		<0.1			0.2

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities at PVNGS monitoring sites, 1991 (sheet 3 of 3)

Parameter		Site 1	4	6	40	42	Cumulative total
Species composition and percent cover (continued)							
Grasses (continued)							
Festuca octoflora	Six-weeks fescue	0.1		0.2			0.3
Muhlenbergia microsperma	Littleseed muhly	--					--
Schismus barbatus	Mediterranean grass	0.5	0.6	0.4	0.5	0.3	2.3
Cacti							
Opuntia acanthocarpa	Buckhorn cholla		<0.1			--	<0.1
Opuntia echinocarpa	Silver cholla; golden cholla		0.4				0.4
Opuntia leptocaulis	Desert Christmas cactus	--					--
Opuntia ramosissima	Diamond cholla		0.8			--	0.8
Species diversity and number of plots							
Species richness		23	20	24	8	16	42
Heterogeneity (H')		.65	.54	.61	.28	.37	NA
Plots		20	20	20	20	20	100

Key: -- (dash), species present in plot but not on transect; NA, not applicable.

*Scientific name.

†Common name.

Table 6-7. Species composition, cover, and diversity of flora in three salt bush (Atriplex spp.) communities at PVNGS monitoring sites, 1991 (sheet 1 of 2)

Parameter		Site 2	Site 3	Site 44	Cumulative total
Species composition and percent cover					
Shrubs					
Atriplex linearis*	Salt bush; narrow-leaved wingscale†	0.5	1.4		1.9
Atriplex polycarpa	Salt bush; all scale	19.9	17.4	11.3	48.6
Larrea divaricata	Creosote bush; greasewood	4.4		0.6	5.0
Lycium Fremontii	Fremont thornbush	0.4	5.5		5.9
Prosopis velutina	Velvet mesquite	6.7	--	1.4	8.1
Herbs					
Allionia incarnata	Trailing four-o'clock	0.1		--	0.1
Amsinckia intermedia	Coast fiddleneck	<0.1	<0.1	--	0.1
Eriastrum diffusum	None		0.1		0.1
Eriophyllum lanosum	Woolly eriophyllum	<0.1	0.1		0.1
Erodium cicutarium	Filaree; heron bill		--		--
Erodium texanum	Large-flowered stork's bill; heron bill	--		--	--
Eucrypta chrysanthemifolia	Torrey eucrypta		--		--
Euphorbia sp.	Spurge	0.3	<0.1	<0.1	0.3
Lepidium virginicum	Pepper grass; pepperwort	0.1	0.2	<0.1	0.3
Linanthus bigelovii	None	--			--
Machaeranthera Coulteri	None		--		--
Nama demissum	Purple mat	--			--
Oligomeris linifolia	Linear-leaved cambess	--	0.4	--	0.4
Pectis papposa	Chinchweed			--	--

Table 6-7. Species composition, cover, and diversity of flora in three salt bush (Atriplex spp.) communities at PVNGS monitoring sites, 1991 (sheet 2 of 2)

Parameter		Site 2	Site 3	Site 44	Cumulative total
		Species composition and percent cover (continued)			
Herbs (continued)					
Pectocarya platycarpa	Broad-nutted comb bur	0.1	0.1	0.1	0.3
Plantago insularis	Woolly plantain; Indian wheat	3.5	2.3	0.7	6.5
Sphaeralcea Coulteri	Coulter globe mallow	0.5	--	0.1	0.6
Thelypodium lasiophyllum	None		--		--
Tidestromia lanuginosa	Woolly tidestromia	--		--	--
Trianthema Portulacastrum	Horse purslane	<0.1			<0.1
Grasses					
Aristida adscensionis	Six-weeks three-awn	<0.1			<0.1
Bouteloua barbata	Six-weeks grama	0.2	0.5		0.7
Schismus barbatus	Mediterranean grass	3.1	8.8	3.4	15.3
Schismus sp.	None	<0.1			<0.1
		Species diversity and number of plots			
Species richness		23	19	15	29
Heterogeneity (H')		.69	.64	.48	NA
Plots		20	20	20	60

Key: -- (dash), species present in plot but not on transect; NA, not applicable.

*Scientific name.

†Common name.

7 Detection of Vegetative Stress Using Remote Sensing

The chemical monitoring of ionic concentrations in leaf phytomass during the growing season is an effective means of detecting physiological changes in vegetation, including vegetative stress. This component of the PVNGS monitoring program is discussed in Sections 6.1 and 9.3 of this report. Another technique to detect vegetative stress, and one which complements the chemical analysis, is remote sensing with color infrared (CIR) aerial photography. The infrared band of the electromagnetic spectrum exhibits a high level of reflectivity from living vegetation and thus can be used to identify physiological and morphological changes in such vegetation. On CIR imagery, more robust growth is generally indicated by reddish hues and less vigorous growth by lighter hues. Color infrared photography is especially useful for detecting vegetative stress in homogeneous assemblages of broad-leaved plants such as cotton. It is more limited in applicability to studies of native vegetation having sclerophyllous leaves, such as Sonoran desert flora.

Vegetative stress in agricultural crops and indigenous vegetation is attributable to drought, poor drainage, nutrient deficiencies associated with varying soil fertility, disease or insect damage, competition from weeds, or other conditions that alter the normal physiology of a plant. Symptoms associated with salt deposition or uptake include chlorosis and necrosis of the leaves, shoot-tip dieback, leaf curl, slower growth, increased susceptibility to disease and insect damage, and changes in structure and diversity in the plant community over time (Foster et al., 1984). Significant stress of agricultural crops and native plant communities from salt drift dispersion would appear on the CIR imagery as a homogeneous tonal signature covering an entire field or a large portion thereof.

The environment within a 5-mile radius of the PVNGS cooling towers, as well as the control sites, was aerially photographed with CIR film on August 28, 1991. The flight line index for the photomission is shown in Figure 7-1, and mission specifications and associated data are given in Table 7-1. Color infrared transparencies were examined over a Richards elevated light table

(Model GFL-940 MCE) using a Bausch and Lomb stereo zoom (X0.7-X3.0) microscope. Exposures were examined for quality (i.e., color, resolution, scale, cloud cover) and changes in color, tone, and pattern (i.e., signatures). Color-positive prints were made of all agricultural and native sites. Sites were ground-truthed on September 21, 1991. Ground verification efforts included (1) observation of species present and general vegetative health, (2) examination of plant parts and tissue for visible symptoms, (3) comparison of plant conditions within and outside the study area, (4) documentation of the location, extent, and severity of stressed areas, and (5) examination of the locations of stressed areas in relation to depositional predictions. All of these factors were weighed to determine if observed stress was attributable to cooling tower drift deposition.

Representative CIR photographs for sites 12 and 13 are included in Appendix G. Site 11, which had been included in the appendix in the past, was fallow in 1991. Site 12 exhibited an uneven growth which was attributed to incomplete germination. Color infrared photography of site 13 showed areas within the west-central portion of the field that were slightly pinker in color than normal. Ground truthing revealed that the top leaves of plants in the affected areas were somewhat paler green in color than in other portions of the field. As was the case for a field near site 11 in 1990, nitrogen deficiency was thought to be the cause.

Examination of the CIR photography and ground-truthing did not reveal any evidence of salt stress in any of the agricultural fields. However, all fields showed evidence of insect pests, including sweet potato whiteflies (<u>Bemisia tabaci</u>), cotton leaf perforators (<u>Bucculatrix thurberiella</u>), and other unidentified leaf eating insects. Whiteflies were especially abundant within site 11, while leaf eating insects were plentiful at site 13. Site 13 also showed damage from cattle which trampled plants while grazing. This site is located within open rangeland. Inconsistent and uneven growth was also noted in several fields.

Examination of CIR aerial photography revealed that, as in 1990, native vegetation was in a more active state of growth than is normally seen during the late summer. This was a result of over one and a quarter inches of

rainfall that occurred just prior to the photomission. Neither CIR photography nor observations in the field yielded any evidence of salt damage from cooling tower drift.

Table 7-1. Summary of 1991 color infrared photomission at PVNGS and vicinity

Subcontractor	Aero/Science P.O. Box 4 Scottsdale, AZ 85252 (602) 948-6634
Date	August 28, 1991
Weather	Clear
Start time	10:30 a.m. Mountain Standard Time
Stop time	12:50 p.m. Mountain Standard Time
Altitude	3000 ft above ground level
Film type	Eastman Kodak 2443 Color Infrared
Camera serial number	RC8 925
Magazine serial number	995
Lens serial number	UAG 414
Camera focal length	152.22 mm
Filter	BL (minus blue)
Shutter speed	1/350 sec
Aperture	F6.8
Scale	1:6000

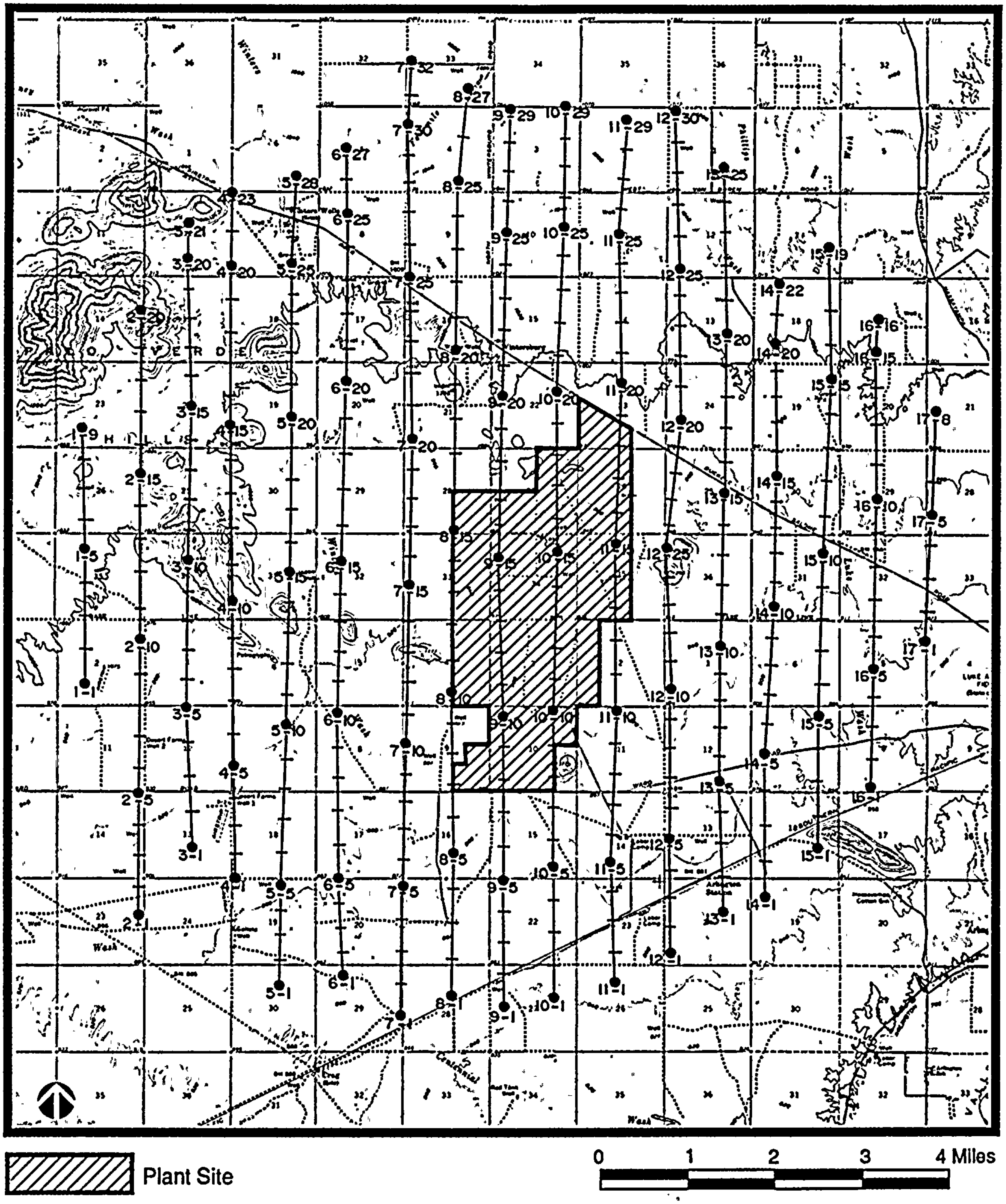

Figure 7-1. Orientation of flight lines of 1991 PVNGS color infrared aerial photomission

8 Soil Analyses

8.1 PHYSICAL ANALYSES

Soil samples collected from each site were analyzed in 1983 to determine their textural classification. The results of these analyses for the upper (0- to 15-centimeter) and lower (15- to 30-centimeter) sample segments are reported in Appendix F. Six inches (15 centimeters) was selected as the break point between the upper and lower sample segments because of the textural changes observed at this level at about one-half of the sites, and because hardpan layers form in these soils at about the 6-inch (15-centimeter) depth. The predominant texture of soils from agricultural sites is sandy loam, followed by loam and silt loam. Sites 33 and 35 have sand to loamy sand textures. Site 33 is located in a small sand dune and site 35 in the Hassayampa River floodplain. The finest-textured soil is found at site 45. No new physical analyses were performed in 1991.

8.2 CHEMICAL ANALYSES

8.2.1 Comparisons of Agricultural and Native Sites, 1991

Twelve soil samples were taken from each agricultural site in 1991: two replications (transects) for each of two depths for each of three seasons (wet, dry, and postdefoliation). Similarly, eight samples were taken from each native site: two replications for each of two depths for each of two seasons (wet and dry). A total of 156 agricultural samples (13 sites) and 248 native samples (31 sites) were collected and analyzed. Analytical results are presented in Appendix F.

Annual mean data for each measured parameter for the agricultural and the native soils are presented in Table 8-1. The means of the two groups were significantly different for 13 of the 19 measured parameters: electrical conductivity, pH, soluble magnesium, soluble sodium, soluble potassium, fluoride, bicarbonate, carbonate, ammonium, sulfate, exchangeable calcium, exchangeable magnesium, and exchangeable sodium. Where significantly different, the parameter values were greater in agricultural soils than in native soils, except for soluble potassium and carbonate. Such a trend is

expected given the input of chemicals that agricultural soils receive from fertilizer and irrigation water.

8.2.2 Ion Comparisons of Agricultural Soils

Table 8-2 presents the annual mean values for individual parameters for the upper and lower soil depths at the agricultural sites. There were significant differences, as determined by the t-test, between the two depths for six (electrical conductivity, soluble sodium, chloride, fluoride, phosphate, and sulfate) of the 19 parameters measured. The prevailing trend of no significant difference between the upper and lower depths is expected due to the mixing of soil layers as a result of agricultural practices.

Table 8-3 presents mean values for each parameter when upper and lower depth samples are averaged by season: April (following the wet season), July (following the dry season), and November (following cotton defoliation). A comparison of wet and dry season concentrations revealed a significant difference in the means for soluble calcium, bicarbonate, ammonium, phosphate, exchangeable calcium and exchangeable magnesium. The values for all of these parameters were significantly higher in July than in April. Soluble calcium and bicarbonate were significantly higher in July than in both April and November while ammonium was significantly higher in both July and November than in April. In comparing dry season and postdefoliation parameter concentrations, exchangeable calcium was found to be significantly higher in November than in both April and July.

The annual mean value for each parameter by site is presented in Table 8-4. Sites 7, 11, 24, 25, 28, 30, 31, 32, and 45 were fallow in 1991. Sites 12 and 13 were planted in cotton and sites 23 and 43 in alfalfa in 1991. Most sites were in the same condition in 1991 as they were in 1989 and 1990, with the exception of sites 11, 12, 23, 25, and 30. Sites 11, 25, and 30 were planted in cotton in 1989 and were fallow in 1990. Site 12 was fallow in both 1989 and 1990 while site 23 was planted in cotton during 1989-90. A least-significant-difference (LSD) procedure was used to segregate the sites into homogeneous units based on the concentration of each parameter. The procedure also made it possible to identify statistical outliers. These statistical groupings are indicated by superscript in Table 8-4. By any

reasonable use of statistical measures, no agricultural site can be judged, overall, to be significantly different from the others in the monitoring program. Site 43 (a control site) did exhibit significantly higher readings for seven of the nineteen measured parameters as compared to all others in 1991. Site 43 had the significantly highest readings for electrical conductivity, soluble sodium, chloride, boron, phosphate, sulfate, and exchangeable magnesium.

Figure 8-1 illustrates the concentration of sodium at individual agricultural sites for each depth and season. Sodium was considered the best indicator because it is an important constituent of the cooling tower basin water and is found at concentrations above the detection limit in deposition samples. The upper and lower samples from site 7, for example, had mean concentrations of 65 and 88 parts per million of soluble sodium, respectively, in the wet season. In 7 of the 39 samplings (that is, 13 sites for 3 seasons) represented in Figure 8-1, the soluble sodium concentration is greater in the upper-depth segment than in the lower-depth segment.

8.2.3 Ion Comparisons of Native Soils

Mean values for parameters measured in the upper and lower soil samples collected from native sites are also shown in Table 8-2. The samples differed significantly by depth for 10 of the 19 parameters: electrical conductivity, soluble sodium, chloride, boron, fluoride, carbonate, nitrate, phosphate, sulfate, and exchangeable sodium. For all parameters exhibiting significant differences, with the exception of phosphate, mean parameter values were higher in the lower-depth samples.

The distribution of soluble sodium by depth at each native site is shown in Figure 8-2. Sodium concentrations were, almost invariably, greater in the lower-depth samples in native soils. Exceptions were the dry season samples from sites 6, 35, and 40.

Sites 3 and 16, both onsite locations, had much higher concentrations of sodium than the other sites. This trend has been consistent throughout the monitoring program. These sites are within 2000 feet of each other in the northwest section of the PVNGS site. As indicated by the Soil Conservation

Service (USDA, 1977), sites 3 and 16 are located in an area of naturally saline soils (Casa Grande-Laveen Complex) which indicates that the amount of sodium measured at these sites reflects naturally occurring conditions.

Table 8-1. Chemical properties of agricultural and native soils at PVNGS monitoring sites, 1991 (means ± standard errors)

Parameter	Agricultural soils (n = 156)	Native soils (n = 248)
Electrical conductivity (mmhos/cm)	1.41 ± 0.08	1.11 ± 0.12
pH (units)	8.78 ± 0.03	8.69 ± 0.02
Soluble ions (ppm)		
Calcium*	46.0 ± 3.3	46.1 ± 1.9
Magnesium	7.4 ± 0.8	5.3 ± 0.3
Sodium	259 ± 15	155 ± 19
Potassium	18.5 ± 1.1	24.5 ± 2.1
Chloride*	171 ± 15	184 ± 30
Boron*	2.0 ± 0.1	2.5 ± 0.3
Fluoride	6.4 ± 0.4	1.3 ± 0.2
Bicarbonate	245 ± 6	191 ± 5
Carbonate	4.4 ± 0.4	6.6 ± 0.7
Nitrate (as N)*	18.5 ± 1.4	22.6 ± 3.2
Ammonium (as N)	3.1 ± 0.1	2.4 ± 0.1
Phosphate (as P)*	2.2 ± 0.1	2.4 ± 0.1
Sulfate	160 ± 21	50.4 ± 7.3
Exchangeable ions (meq/100g)		
Calcium	24.4 ± 0.7	19.8 ± 0.3
Magnesium	2.1 ± 0.1	1.5 ± 0.0
Sodium	2.9 ± 0.1	1.8 ± 0.2
Potassium*	1.2 ± 0.1	1.2 ± 0.1

*For this parameter, means for agricultural and native soil samples are not significantly different at 95-percent confidence level.

Table 8-2. Chemical properties of soil samples collected at two depths at PVNGS agricultural and native monitoring sites, 1991 (means ± standard errors) (sheet 1 of 2)

Parameter	Depth	Agricultural soils (n = 78)	Native soils (n = 124)
Electrical conductivity (mmhos/cm)	U	1.22 ± 0.07	0.69 ± 0.08
	L	1.60 ± 0.14	1.54 ± 0.22
pH (units)*†	U	8.81 ± 0.05	8.66 ± 0.03
	L	8.74 ± 0.04	8.72 ± 0.04
Soluble ions (ppm)			
Calcium*†	U	42.3 ± 3.4	44.4 ± 2.7
	L	49.7 ± 5.8	47.7 ± 2.6
Magnesium*†	U	6.8 ± 0.7	4.9 ± 0.3
	L	8.1 ± 1.5	5.6 ± 0.4
Sodium	U	225 ± 14	81.4 ± 12.6
	L	292 ± 26	228 ± 35
Potassium*†	U	18.8 ± 1.5	24.1 ± 2.6
	L	18.1 ± 1.7	24.9 ± 3.2
Chloride	U	139 ± 15	92.3 ± 20.7
	L	202 ± 25	275 ± 54
Boron*	U	1.9 ± 0.1	1.6 ± 0.3
	L	2.2 ± 0.2	3.4 ± 0.6
Fluoride	U	5.6 ± 0.4	0.8 ± 0.1
	L	7.2 ± 0.6	1.9 ± 0.3
Bicarbonate*†	U	254 ± 8	186 ± 6
	L	236 ± 8	196 ± 7
Carbonate*	U	5.0 ± 0.7	4.7 ± 0.6
	L	3.9 ± 0.6	8.4 ± 1.2
Nitrate (as N)*	U	16.0 ± 1.6	13.8 ± 2.5
	L	21.1 ± 2.3	31.5 ± 5.9
Ammonium (as N)*†	U	3.1 ± 0.2	2.5 ± 0.1
	L	3.2 ± 0.2	2.3 ± 0.1
Phosphate (as P)	U	2.6 ± 0.2	2.7 ± 0.2
	L	1.9 ± 0.1	2.1 ± 0.1
Sulfate	U	115 ± 14	15.8 ± 3.0
	L	204 ± 39	84.9 ± 13.7

Table 8-2. Chemical properties of soil samples collected at two depths at PVNGS agricultural and native monitoring sites, 1991 (means ± standard errors) (sheet 2 of 2)

Parameter	Depth	Agricultural soils (n = 78)	Native soils (n = 124)
Exchangeable ions (meq/100g)			
Calcium*†	U	24.5 ± 1.1	20.0 ± 0.5
	L	24.3 ± 0.9	19.5 ± 0.5
Magnesium*†	U	2.1 ± 0.1	1.5 ± 0.1
	L	2.1 ± 0.1	1.5 ± 0.1
Sodium*	U	2.7 ± 0.2	1.0 ± 0.1
	L	3.1 ± 0.2	2.6 ± 0.4
Potassium*†	U	1.2 ± 0.1	1.2 ± 0.1
	L	1.2 ± 0.1	1.2 ± 0.1

Key: U, upper-depth (0- to 15-centimeter) sample; L, lower-depth (15- to 30-centimeter) sample.

*For this parameter, means for upper- and lower-depth agricultural soil samples are not significantly different at 95-percent confidence level.

†For this parameter, means for upper- and lower-depth native soil samples are not significantly different at 95-percent confidence level.

Table 8-3. Chemical properties of soil samples collected at PVNGS agricultural monitoring sites, April, July, and November 1991 (means ± standard errors)

Parameter	April (end of wet season)	July (end of dry season)	November (postdefoliation)
Electrical conductivity (mmhos/cm)	1.34 ± 0.09[a]	1.49 ± 0.20[a]	1.42 ± 0.09[a]
pH (units)	8.83 ± 0.05[a]	8.66 ± 0.05	8.84 ± 0.06[a]
Soluble ions (ppm)			
Calcium	39.8 ± 6.1[a]	61.3 ± 6.3	37.0 ± 4.2[a]
Magnesium	6.3 ± 1.2[a]	9.7 ± 1.9[a]	6.2 ± 0.9[a]
Sodium	212 ± 15[a]	289 ± 38[a]	276 ± 18[a]
Potassium	15.3 ± 1.6[a]	21.2 ± 2.2[a]	18.9 ± 1.9[a]
Chloride	149 ± 16[a]	183 ± 37[a]	181 ± 21[a]
Boron	1.8 ± 0.1[a]	2.2 ± 0.3[a]	2.0 ± 0.1[a]
Fluoride	6.4 ± 0.6[a]	6.1 ± 0.7[a]	6.8 ± 0.7[a]
Bicarbonate	224 ± 9[a]	289 ± 10	222 ± 9[a]
Carbonate	4.6 ± 0.9[a]	4.8 ± 0.8[a]	4.0 ± 0.6[a]
Nitrate (as N)	18.4 ± 2.9[a]	16.2 ± 2.1[a]	21.1 ± 2.2[a]
Ammonium (as N)	2.4 ± 0.2	3.4 ± 0.2[a]	3.5 ± 0.3[a]
Phosphate (as P)	1.8 ± 0.2[a]	2.6 ± 0.2[b]	2.3 ± 0.2[ab]
Sulfate	157 ± 24[a]	191 ± 56[a]	132 ± 16[a]
Exchangeable ions (meq/100g)			
Calcium	18.7 ± 0.4	23.7 ± 0.7	30.8 ± 1.6
Magnesium	1.8 ± 0.1[a]	2.1 ± 0.2[ab]	2.5 ± 0.2[b]
Sodium	2.7 ± 0.2[a]	3.0 ± 0.3[a]	2.9 ± 0.2[a]
Potassium	1.1 ± 0.1[a]	1.2 ± 0.1[a]	1.2 ± 0.1[a]

Key: For each parameter, means with same superscript are not significantly different at 95-percent confidence level.

Note: All values derived from analysis of 52 samples.

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1991 (means ± standard errors) (sheet 1 of 2)

	Site						
Parameter	7 Fallow	11 Fallow	12 Cotton	13 Cotton	23 Alfalfa	24 Fallow	25 Fallow
Electrical conductivity (mmhos/cm)	0.51 ± 0.03[a]	1.84 ± 0.12[de]	1.01 ± 0.09[abc]	1.45 ± 0.16[bcd]	1.03 ± 0.08[abc]	1.12 ± 0.11[abc]	1.61 ± 0.14[cde]
pH	8.74 ± 0.03[cd]	8.48 ± 0.05[b]	8.73 ± 0.03[cd]	8.53 ± 0.05[b]	8.80 ± 0.04[cd]	8.78 ± 0.06[cd]	8.12 ± 0.04[a]
Soluble ions (ppm)							
Calcium	38.0 ± 5.2[abc]	46.3 ± 4.2[bc]	31.9 ± 2.7[abc]	40.0 ± 5.2[abc]	33.4 ± 4.9[abc]	34.0 ± 2.5[abc]	138 ± 15[e]
Magnesium	5.6 ± 0.5[a]	5.2 ± 0.5[a]	2.9 ± 0.3[a]	5.7 ± 0.9[a]	3.8 ± 0.5[a]	4.9 ± 0.5[a]	25.8 ± 3.2[b]
Sodium	75.8 ± 6.1[a]	335 ± 28[ef]	186 ± 16[abcd]	264 ± 34[cde]	215 ± 19[bcd]	202 ± 22[bcd]	149 ± 8[abc]
Potassium	12.5 ± 1.8[bc]	40.9 ± 2.3[f]	35.3 ± 1.4[ef]	27.2 ± 2.2[d]	8.3 ± 0.8[ab]	28.5 ± 1.8[d]	31.2 ± 2.0[de]
Chloride	25.3 ± 5.1[a]	289 ± 30[b]	119 ± 17[a]	234 ± 40[b]	89.3 ± 12.6[a]	93.7 ± 16.9[a]	124 ± 21[a]
Boron	1.0 ± 0.1[a]	2.6 ± 0.2[de]	1.8 ± 0.1[abcd]	1.5 ± 0.2[abc]	1.9 ± 0.1[bcde]	1.6 ± 0.1[abc]	1.2 ± 0.1[ab]
Fluoride	1.9 ± 0.2[ab]	9.4 ± 0.8[ef]	10.9 ± 1.0[fg]	8.8 ± 0.6[e]	13.3 ± 0.8[h]	3.4 ± 0.2[bc]	1.2 ± 0.1[a]
Bicarbonate	214 ± 12[bc]	247 ± 15[c]	250 ± 8[c]	216 ± 16[bc]	304 ± 24[d]	188 ± 10[ab]	159 ± 12[a]
Carbonate	2.4 ± 0.0[a]	2.4 ± 0.0[a]	2.4 ± 0.0[a]	2.4 ± 0.0[a]	2.5 ± 0.1[a]	2.7 ± 0.2[a]	2.4 ± 0.0[a]
Nitrate (as N)	7.1 ± 1.7[ab]	30.6 ± 1.9[c]	9.0 ± 1.5[ab]	7.8 ± 0.7[ab]	4.9 ± 0.3[a]	35.6 ± 5.9[c]	49.3 ± 7.5[d]
Ammonium (as N)	3.1 ± 0.6[abc]	2.8 ± 0.5[ab]	2.8 ± 0.5[ab]	2.8 ± 0.6[ab]	2.6 ± 0.4[ab]	2.1 ± 0.3[a]	3.9 ± 0.8[bcd]
Phosphate (as P)	3.5 ± 0.4[d]	1.6 ± 0.1[abc]	3.4 ± 0.2[d]	1.7 ± 0.1[abc]	2.1 ± 0.2[bc]	2.0 ± 0.2[bc]	2.1 ± 0.1[c]
Sulfate	10.1 ± 4.3[a]	164 ± 14[abcd]	55.9 ± 15.4[ab]	117 ± 25[abcd]	75.2 ± 33.1[abc]	73.5 ± 14.9[abc]	296 ± 20[d]
Exchangeable ions (meq/100g)							
Calcium	20.9 ± 1.7[ab]	30.8 ± 4.0[def]	22.5 ± 0.7[abc]	20.0 ± 0.6[ab]	23.5 ± 1.5[abc]	21.6 ± 0.6[ab]	27.9 ± 1.4[cde]
Magnesium	2.3 ± 0.1[ef]	2.6 ± 0.3[f]	1.4 ± 0.0[bc]	1.7 ± 0.1[cd]	2.0 ± 0.1[de]	1.8 ± 0.1[cd]	3.3 ± 0.1[g]
Sodium	0.8 ± 0.1[a]	3.6 ± 0.3[e]	2.1 ± 0.1[bc]	2.3 ± 0.1[cd]	3.5 ± 0.2[e]	2.0 ± 0.1[bc]	1.4 ± 0.1[ab]
Potassium	0.6 ± 0.0[b]	2.5 ± 0.1[i]	2.1 ± 0.0[h]	1.5 ± 0.0[f]	1.2 ± 0.0[e]	1.8 ± 0.1[g]	1.5 ± 0.0[f]

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1991 (means ± standard errors) (sheet 2 of 2)

Parameter	Site 28 Fallow	Site 30 Fallow	Site 31 Fallow	Site 32 Fallow	Site 43 Alfalfa	Site 45 Fallow
Electrical conductivity (mmhos/cm)	0.67 ± 0.05^{a}	2.13 ± 0.09^{e}	1.92 ± 0.16^{de}	0.86 ± 0.05^{ab}	2.91 ± 0.68^{f}	1.33 ± 0.21^{bcd}
pH	8.86 ± 0.06^{d}	8.48 ± 0.05^{b}	9.13 ± 0.06^{e}	9.51 ± 0.07^{f}	8.68 ± 0.02^{c}	9.26 ± 0.06^{e}
Soluble ions (ppm)						
Calcium	29.2 ± 3.7^{abc}	52.5 ± 4.7^{c}	27.9 ± 3.8^{ab}	23.3 ± 3.5^{ab}	83.7 ± 22.4^{d}	20.1 ± 3.2^{a}
Magnesium	2.6 ± 0.3^{a}	7.3 ± 0.5^{a}	2.7 ± 0.3^{a}	4.8 ± 1.2^{a}	22.8 ± 6.6^{b}	2.4 ± 0.3^{a}
Sodium	131 ± 7^{ab}	389 ± 21^{f}	401 ± 31^{f}	202 ± 13^{bcd}	528 ± 132^{g}	287 ± 36^{def}
Potassium	9.2 ± 0.8^{ab}	11.3 ± 1.2^{b}	9.3 ± 0.7^{ab}	4.2 ± 1.2^{a}	18.4 ± 5.8^{c}	3.8 ± 0.2^{a}
Chloride	41.0 ± 6.2^{a}	330 ± 23^{b}	267 ± 34^{b}	47.8 ± 6.2^{a}	484 ± 119^{c}	77.8 ± 21.5^{a}
Boron	1.4 ± 0.2^{ab}	2.3 ± 0.2^{cde}	2.8 ± 0.2^{e}	1.6 ± 0.1^{abc}	4.2 ± 0.9^{f}	2.6 ± 0.3^{de}
Fluoride	1.7 ± 0.2^{ab}	4.9 ± 0.2^{cd}	6.6 ± 0.2^{d}	11.3 ± 1.3^{g}	1.2 ± 0.1^{a}	8.9 ± 0.8^{e}
Bicarbonate	226 ± 10^{bc}	223 ± 13^{bc}	242 ± 17^{c}	326 ± 16de	244 ± 17^{c}	347 ± 18^{e}
Carbonate	3.1 ± 0.6^{a}	2.4 ± 0.0^{a}	4.7 ± 1.4^{a}	8.1 ± 1.2^{b}	2.4 ± 0.0^{a}	20.1 ± 2.5^{c}
Nitrate (as N)	15.7 ± 2.8^{b}	28.9 ± 2.3^{c}	30.1 ± 2.8^{c}	5.1 ± 0.4^{a}	5.7 ± 0.4^{a}	11.4 ± 1.8^{ab}
Ammonium (as N)	2.5 ± 0.2^{a}	4.4 ± 0.4^{cd}	2.9 ± 0.4^{ab}	2.5 ± 0.4^{a}	5.0 ± 0.5^{d}	3.2 ± 0.3^{abc}
Phosphate (as P)	1.8 ± 0.2^{bc}	1.0 ± 0.1^{a}	2.1 ± 0.2^{c}	1.3 ± 0.2^{ab}	4.9 ± 0.7^{e}	1.5 ± 0.3^{abc}
Sulfate	47.9 ± 6.3^{ab}	251 ± 17^{cd}	216 ± 37^{bcd}	34.8 ± 13.1^{a}	575 ± 206^{e}	162 ± 85^{abcd}
Exchangeable ions (meq/100g)						
Calcium	34.7 ± 4.3^{f}	33.1 ± 3.2^{ef}	17.5 ± 1.0^{a}	18.3 ± 1.1^{a}	20.3 ± 1.1^{ab}	25.9 ± 2.3^{bcd}
Magnesium	1.8 ± 0.2^{cd}	3.2 ± 0.3^{g}	0.9 ± 0.0^{a}	0.9 ± 0.0^{ab}	3.9 ± 0.4^{h}	1.9 ± 0.1^{de}
Sodium	2.3 ± 0.1^{bc}	4.7 ± 0.1^{f}	3.1 ± 0.2^{de}	2.0 ± 0.1^{bc}	4.5 ± 0.9^{f}	5.2 ± 0.3^{f}
Potassium	1.2 ± 0.1^{e}	1.0 ± 0.0^{d}	0.5 ± 0.0^{b}	0.2 ± 0.0^{a}	0.8 ± 0.1^{c}	0.6 ± 0.0^{b}

Key: For each parameter, means with same superscript letter are not significantly different at 95-percent confidence level. Alphabetic sequence of superscripts corresponds to increase in concentration level; thus letter a represents lowest level and letters b through i successively higher levels.

Note: All values derived from analysis of 12 samples.

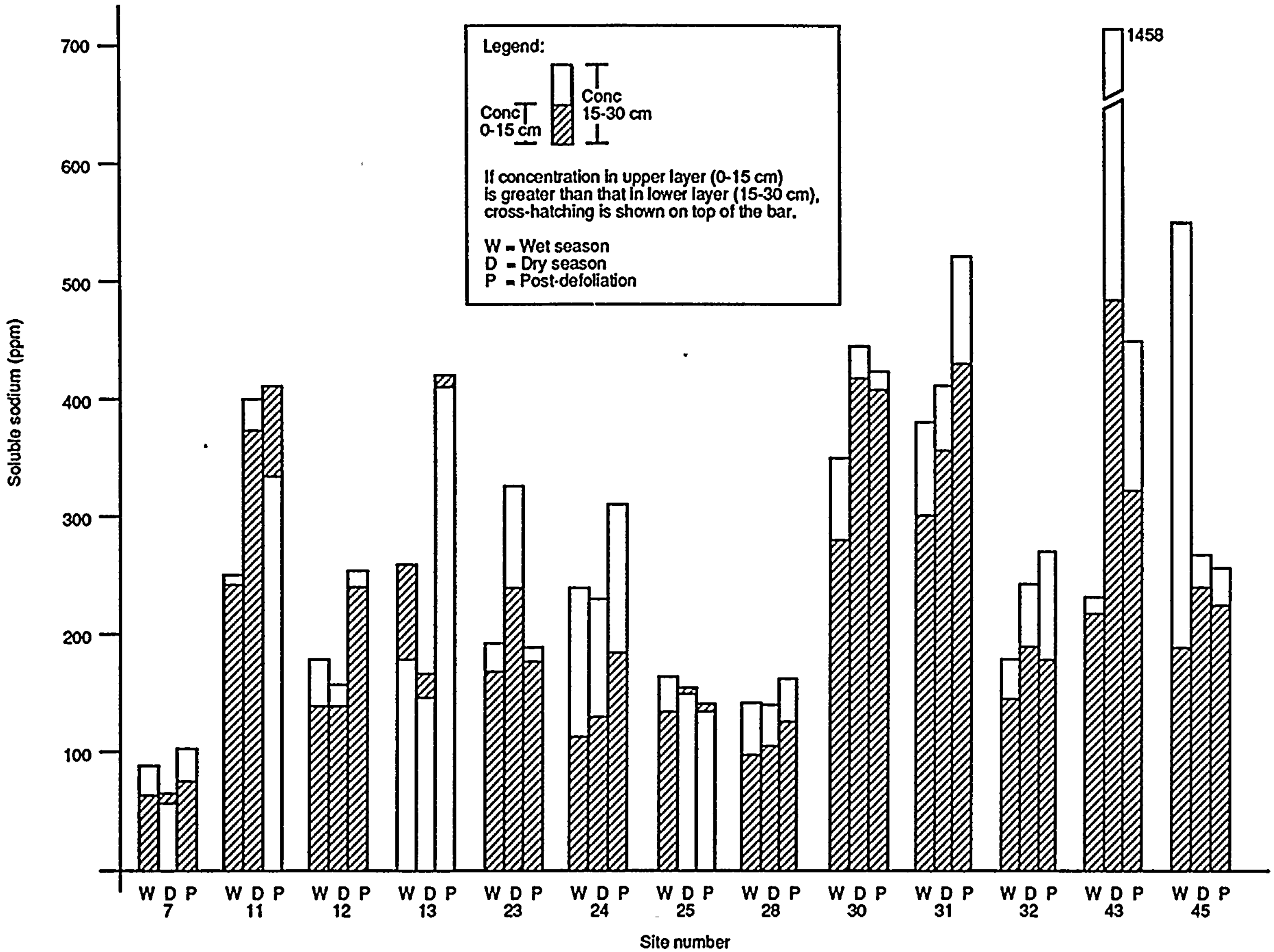

Figure 8-1. Mean concentrations of soluble sodium in soils at PVNGS agricultural monitoring sites by depth and season, 1991

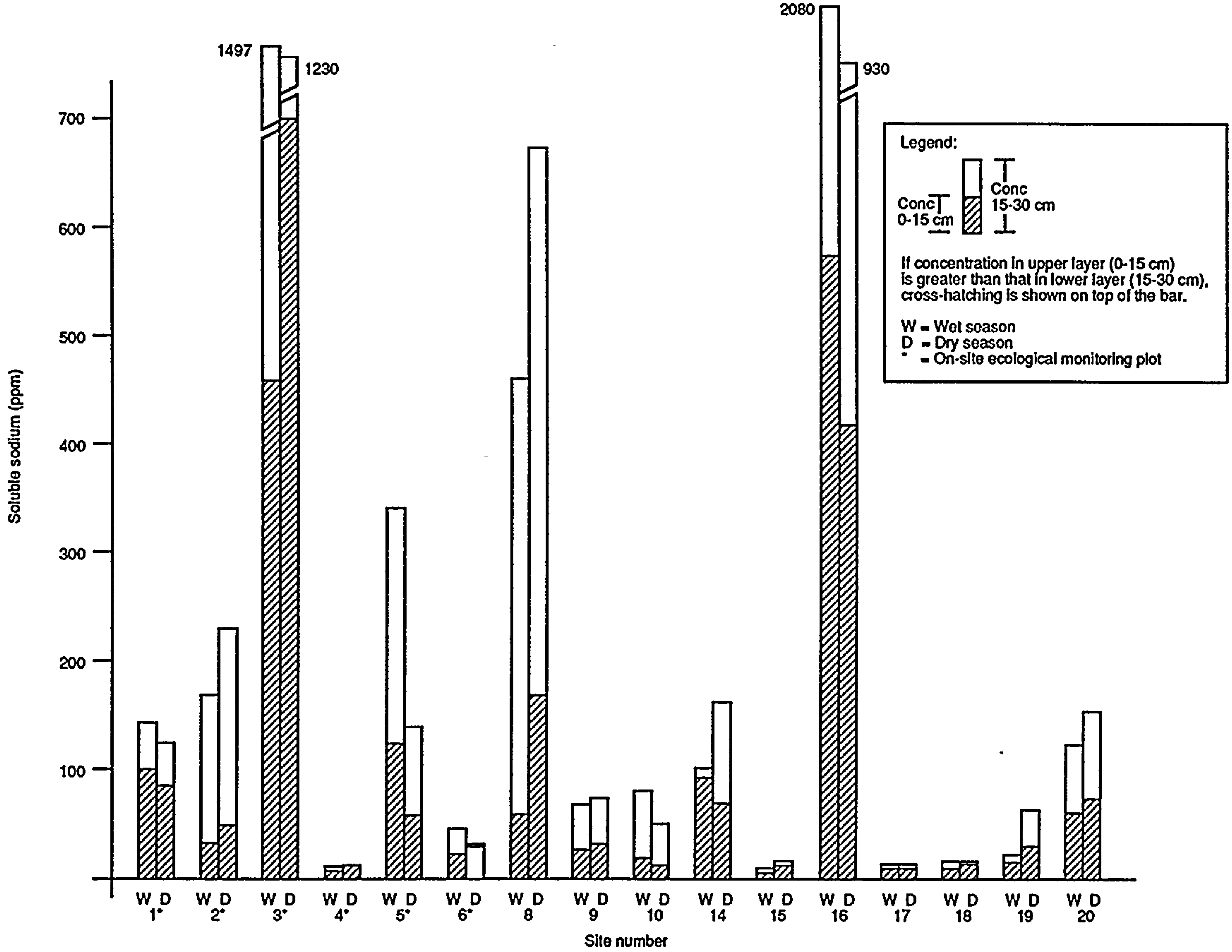

Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites by depth and season, 1991 (sheet 1 of 2)

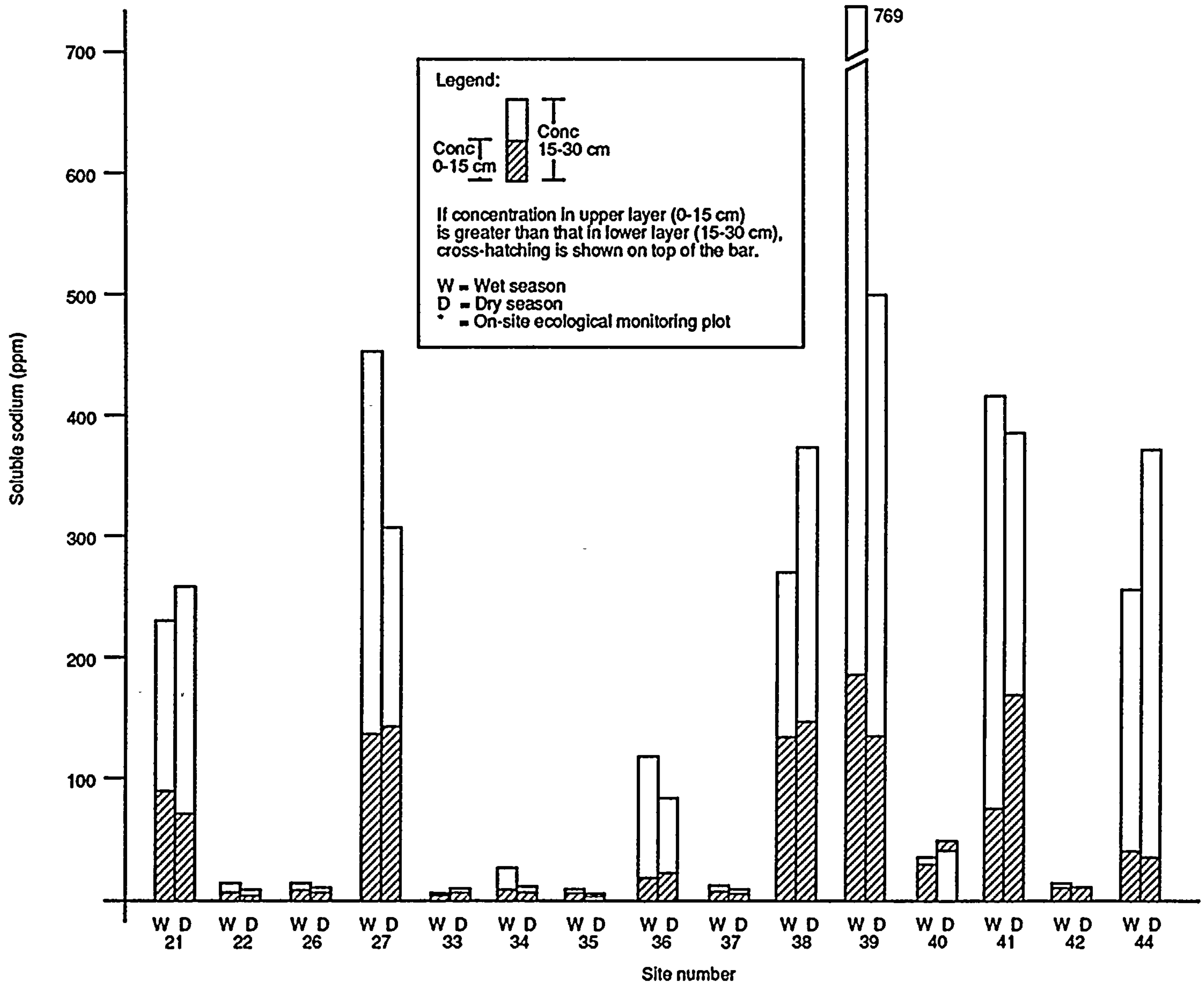

Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites by depth and season, 1991 (sheet 2 of 2)

9 Discussion of Comparisons of Parameters

9.1 METEOROLOGY

9.1.1 General Meteorology and Climatological Comparisons

Monthly averages of temperature, dew point, and wind speed and monthly totals of precipitation at PVNGS for 1991 and for the period 1974-1985 are presented in Table 9-1. National Weather Service Phoenix (NWS) climatological data for 1991 and the period 1950-1980 are presented in Table 9-2. As shown in these data, the precipitation at PVNGS for 1991 was higher than the annual average for the period 1974-1985. The average wind speed at PVNGS for 1991 was slightly higher than the 1974-1985 annual average. The late winter and spring months had average wind speeds generally higher than the 1974-1985 averages. The annual average temperature for 1991 at PVNGS was the same as the long-term average. The precipitation at NWS for 1991 was greater than the annual average for 1950-1980. The average wind speed for 1991 at NWS was slightly lower than the annual average recorded for 1950-1980. The average 1991 temperature for NWS was considerably higher than the NWS long-term average.

A comparison of the data presented in Tables 9-1 and 9-2 shows that, in terms of 1991 annual averages, the temperature and dew point for PVNGS were 4°F lower than those for NWS. The precipitation for PVNGS was slightly higher than the NWS precipitation collected during 1991. The PVNGS wind speeds were higher than the wind speeds at NWS during 1991.

9.1.2 Effects of Meteorological Parameters on Dustfall, Soils, and Vegetation

Meteorological conditions for the site area influence the atmospheric particulate levels, soil conditions, runoff, and vegetative growth. These impacts may be locally altered by irrigation activities.

Locally heavy thunderstorms or other severe weather can at times damage one or more sites in the monitoring area. Which sites are affected is dependent upon the size, strength, path, and duration of any particular storm.

9.2 DRIFT DEPOSITION

Monthly deposition of drift constituents calculated from samples collected during the preoperational period (1983-1985) and 1991 were analyzed to determine whether differences exist between the two sets.

In view of the absence of changes in data from 1984 to 1985 related to the limited operation of PVNGS in 1985, the preoperational data set has been defined to include

1. Valid 1983 and 1984 data from all monitoring sites

2. Valid 1985 data from all offsite monitoring sites

3. 1985 data from those onsite locations at which measured deposition for operating months exceeded 10 times the predicted deposition for those periods (this excludes sites 14, 16, 20, 80, 81, and 83)

Therefore, the preoperational period for drift deposition at all agricultural sites is May 1983 through December 1985. The preoperational period for all native sites is also May 1983 through December 1985 with the following exceptions. According to results of a previous analysis (NUS, 1987a), the preoperational period for sites 16 and 20 is defined as May 1983 through December 1984. For sites 80, 81, and 83, which did not begin operation until May 1985, no meaningful preoperational period can be defined, as there were only 4 months without significant drift from the PVNGS Unit 1 cooling towers. Site 82 also began operation in May 1985, and the 8 months of data available are insufficient for an adequate assessment of preoperational drift deposition. Thus, the preoperational data set for sites 80-83 is defined as the mean for the onsite locations (i.e., sites 1-6, 10, 14, 16, 20, and 27) for 1983-1985 excluding sites 14, 16, and 20 in 1985 and including site 82 in 1985.

The preoperational values for all ions and total suspended solids (TSS) were recalculated in 1987 using the method described in Chapter 5. This method includes, in the calculation of means and standard errors, values of one-half the detection limit for those samples of ions and TSS whose concentrations were below the detection limit. For the onsite locations, the preoperational

period for 1985 was reevaluated to determine if the criteria defined above were valid. The results suggest that site 14 data should have been excluded from the 1985 calculations. However, the impact of excluding these data was calculated and found to be insignificant. As a result, the 1985 values presented herein include site 14 data.

The two data sets (i.e., preoperational and 1991) were compared statistically to determine whether any differences were significant at the 95-percent confidence level. Comparisons were made for those major ionic constituents present in the cooling tower basin water whose deposition was not below the laboratory detection limit more than 25 percent of the time. These selected ions constitute the most significant portion of the salt drift from the cooling towers. Although the fractions of samples below the detection limit for potassium and TSS were 31.0 and 28.3 percent, respectively, for 1991, these parameters are included in the statistical comparison for consistency with previous annual reports and as an indicator of relative change from background deposition. As evidenced by the annual reports for 1984 through 1990, as well as the data presented in Chapter 5 of this report, ionic deposition varies greatly by site and by month for any particular year. Accordingly, comparisons are provided for nearly homogeneous site groups (both agricultural and native [nonagricultural] sites) as well as by month. In addition, comparisons are made for agricultural and native control sites for the two data sets.

9.2.1 Drift Deposition Comparisons and Methods

Monthly deposition values were analyzed to determine the differences in deposition rate between the preoperational period and 1991. The data for each constituent were examined individually by monitoring site and by month. Many of the monthly samples produced concentrations at or below the detection limit more than 25 percent of the time. Of the 14 parameters measured in each sample, only sodium, calcium, and magnesium were not routinely below their analytical detection limits. Other ions were not included in any subsequent analyses except potassium and TSS as noted above.

The monitoring sites were divided into four groups: agricultural sites; native sites; supplemental sites, which are near the cooling towers; and

native sites at various distances from PVNGS. For comparison, deposition measured at the four control sites (two native and two agricultural sites) were also examined. The statistical significance of differences in the monthly means of each constituent between the preoperational and 1991 data sets was determined using the two sample t-tests. Depending on the differences in the variances between the two means, the calculation of the t-statistic assumed either the pooled-variance t-test or the separate-variance t-test. The pooled-variance t-test was used when the variances of the data sets were statistically equal at the 95-percent confidence level. The separate-variance estimate was used when the two variances were unequal statistically at the 95-percent confidence level.

9.2.2 Drift Deposition at Agricultural Sites

Table 9-3 presents the annual deposition of the four measurable ions and TSS for all agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45) for the preoperational and 1991 data sets. As the table indicates, the differences between the mean annual deposition of calcium, magnesium, and TSS for the preoperational period and 1991 were not statistically significant: both sodium and potassium had statistically significant lower deposition in 1991 than in the preoperational period.

Figures 9-1 through 9-3 show the mean monthly deposition for the preoperational and 1991 data sets for the combined agricultural sites. These figures reflect the large variability in measured deposition rates both month-to-month and within any month for both data sets. The preoperational deposition for sodium, calcium, and potassium is significantly larger in July than the deposition for the respective ions for 1991, while a March peak is evident for the same three ions for the 1991 deposition.

Table 9-4 presents the annual deposition for sodium, potassium, and calcium for each agricultural site for the preoperational period and 1991. Although chloride and sulfate were both prominent ions in the cooling tower basin water, deposition rates were not calculated because 38 and 88 percent, respectively, of the deposition samples were below their detection limits. Also included in the table is an indication of those sites and analytes for

which statistically significant changes occurred between the two data periods.

Most of the changes in ionic deposition in 1991 that were statistically significant at some of the agricultural sites were decreases from the respective preoperational means. Only the deposition of sodium, potassium, and calcium at site 23 and that of calcium at site 43 showed significant increases between the preoperational period and 1991. Decreases in the deposition of sodium were statistically significant at sites 24, 25, 31, and 45. Decreases in potassium deposition were statistically significant at sites 7, 11, 24, 25, 31, 43, and 45. The deposition of calcium at sites 7, 11, 24, 25, and 28 was significantly lower in 1991 than in the preoperational period.

9.2.3 Drift Deposition at Native Sites

Table 9-5 presents the annual deposition of the four measurable ions and TSS at the combined native sites (sites 1-6, 8-10, 14-22, 26, 27, 33-42, 44, and 80-83) for the preoperational period and 1991. The mean annual deposition of potassium showed a statistically significant decrease between the preoperational period and 1991. The mean annual deposition for sodium showed a statistically significant increase.

Tables 9-6 through 9-9 present annual deposition of the four measurable ions and TSS for native sites at various distances from PVNGS for the preoperational period and 1991. Table 9-6 presents data for the four supplemental sites (sites 80-83) nearest the cooling towers; Table 9-7 provides data for the other native sites (sites 3, 14, 16, and 20) within 1 mile of the centroid of the Unit 2 cooling towers; and Tables 9-8 and 9-9 present the analyses for those native sites from 1 to 2 miles (sites 1, 2, 5, 6, 9 and 10) and more than 2 miles (sites 4, 8, 9, 15, 17, 18, 19, 21, 22, 26, 27, 33-42, and 44) from PVNGS, respectively.

Changes in sodium deposition rates from preoperational values showed a statistically significant increase at all distances. The mean annual sodium deposition and the magnitudes of the differences between preoperational and 1991 values decreased with increasing distance from PVNGS. Potassium showed

significant decreases between the preoperational period and 1991 at distances greater than 1 mile. Calcium significantly increased at the supplemental sites, showed no significant change for other sites out to 2 miles, and showed a significant decrease at those sites more than 2 miles from PVNGS. Magnesium showed a significant increase at the supplemental sites and a significant decrease for sites beyond 2 miles. Total suspended solids showed a significant increase at the supplemental sites and no significant change for those sites more distant from the cooling towers between the preoperational period and 1991.

Figures 9-4 through 9-6 show the mean monthly deposition for the preoperational period and for 1991 at all native sites. As with the agricultural sites, a large variability in deposition rates exists both within months and from month-to-month for both periods for most ions, which makes apparent peaks not statistically significant (except for sodium peaks in January and March 1991).

Table 9-10 presents annual deposition for sodium, potassium, and calcium for each native site for the preoperational period and 1991. The table identifies individual sites and analytes that showed statistically significant changes in annual mean values between the preoperational period and 1991.

Annual sodium deposition significantly increased at all sites within 1.6 miles of the cooling towers (1, 2, 3, 10, 14, 16, 20, 80, 81, 82, 83) and at sites 18 and 19, 2.8 and 2.3 miles, respectively, west of the cooling towers. Examination of the monthly data for the native monitoring locations (Figures 9-4 through 9-6) indicate that the largest differences from the preoperational period occurred in January and March. Decreases in the sodium deposition rate were significant at sites 15, 33, 34, 38, 40, and 44, all five or more miles from PVNGS. Annual calcium deposition significantly increased at three of the supplemental sites (80, 81, and 83). The largest differences occurred in January and November. There was a significant decrease in the calcium deposition rate at sites 5 and 27. Annual potassium deposition decreased significantly at sites 1, 3, 6, 8, 9, 10, 15, 17, 18,

21, 22, 26, 27, 33-39, 41, 42, 82, and 83 in 1991. There was no significant increase in potassium deposition at any site in 1991.

9.2.4 Drift Deposition at Agricultural and Native Control Sites

The salt deposition monitoring network includes two sets of neighboring agricultural and native control sites. The purpose of the control sites is to measure natural levels and distribution of salt deposition at distances unlikely to be affected by PVNGS cooling tower emissions. These paired monitoring locations are sites 25 and 40, located approximately 20 miles northwest of PVNGS, and sites 42 and 43 some 15 miles southeast; sites 25 and 43 are the agricultural sites, although site 25 was fallow in 1991.

Table 9-11 presents the annual drift deposition for both the agricultural and native paired control sites for the preoperational period and 1991.

For the agricultural site pair, sodium, potassium, calcium, magnesium, and TSS significantly decreased between the preoperational period and 1991. For the native site pair, sodium and potassium significantly decreased.

9.2.5 Deposition Measurement and Prediction

Table 9-12 provides estimated net sodium deposition in 1991 at each of the 15 onsite drift deposition monitoring locations (sites 1-6, 10, 14, 16, 20, 27, and 80-83), as corrected for the preoperational period deposition. Since TDS was not measured in the drift deposition samples, the TDS values for 1991 were estimated from measured sodium deposition rates, assuming that the average TDS-to-sodium ratio in the circulating water at Units 1, 2, and 3 of 3.2 ± 0.04 (Appendix B) was applicable. The last column in the table provides the estimated net TDS deposition for each onsite location in 1991.

Assuming that the preoperational values are representative of 1991 absent any plant effects, any positive changes should be from other sources, including the PVNGS cooling towers. It is clear from these data that during 1991 the sites with the largest net deposition were those closest to the cooling towers (sites 16, 20, and 80-83).

Table 9-13 presents a comparison of the measured net deposition values and FOG-code-predicted deposition (Table 4-4) at each onsite location for 1991. At only one of these locations (Site 27), the net deposition was not significantly different from zero; the values are listed for purposes of qualitative comparison with predictions, but are not used in subsequent quantitative comparisons.

In general, there is reasonably good agreement between the net measured and predicted deposition values for 1991 (Figure 9-7) except at sites 16, 27, 80, 81, 82, and 83. The correlation coefficient (R^2) of 0.52 as presented in Table 9-13 is calculated using data from all 15 onsite locations for 1991. This correlation coefficient shows a much better correlation than the value (0.29) for the corresponding 1990 data set.

To a considerable extent, the correlation is influenced by the application of the NUS FOG model at the very close distances to the towers where other influences (micro wind field effects and water reclamation facility emissions) are effective.

A second linear regression was performed excluding data for sites 16 and the 80 series and including data for near-site locations 18 and 19 located 2.8 and 2.3 miles, respectively, west of the cooling towers. The measured net deposition values for sites 18 and 19 (Table 9-10) are 9.3 and 15.4 pounds per acre-year, while the predicted deposition values are 5.0 and 10.1 pounds per acre-year, respectively. The resulting correlation coefficient (R^2) for this data set is 0.91, confirming the conclusion of model prediction inaccuracies at very close distances but generally reasonable predictions for the remaining onsite and near-site locations. Figure 9-8 presents the linear regression and measured versus predicted deposition values for the second set.

9.2.6 Deposition Summary and Conclusions

From analyses of the drift deposition in 1991, the following conclusions can be drawn:

1. There was a statistically significant decrease in sodium and potassium deposition between the preoperational period and 1991 for

the combined agricultural sites. Only site 23, among the agricultural sites, had a statistically significant increase for sodium, potassium, and calcium for 1991. Mean deposition for all other agricultural sites for 1991 was lower than the preoperational period for sodium, potassium, and calcium.

2. Deposition of sodium for the combined native sites displayed a statistically significant increase for 1991 compared to the preoperational period, whereas a statistically significant decrease was observed for potassium for the same group. Supplemental sites, other native sites within 1 mile of PVNGS, and native sites 1 to 2 miles from PVNGS had statistically significant increases of sodium deposition in 1991 versus the preoperational period, while those native sites greater than 2 miles from PVNGS showed a statistically significant decrease in deposition for sodium, potassium, calcium, and magnesium.

3. The agricultural control sites (25 and 43) displayed a statistically significant decrease in sodium, potassium, calcium, magnesium, and TSS deposition between the preoperational period and 1991 (although site 25 was fallow in 1991). The native control sites (40 and 42) showed a statistically significant decrease in sodium and potassium deposition between the preoperational period and 1991.

4. A reasonable correlation was obtained between NUS FOG-code-predicted deposition and measured deposition in 1991.

9.3 AGRICULTURAL CROPS AND NATIVE VEGETATION

The variability of ionic concentrations of leaf phytomass and leaf surface rinsate and the structural characteristics of native plant communities have been discussed in previous reports (NUS, 1985; 1986a,b; 1987a,b; 1988a; 1989; 1990; 1991a). The following sections compare the results of chemical and structural analyses for 1991 with pooled data for the period 1983 through 1985 (i.e., the preoperational period).

9.3.1 Agricultural Crops

A total of 13 agricultural monitoring sites were identified at the beginning of the monitoring program in 1983. These sites were selected because they were representative of local agricultural practices and were in the general vicinity of PVNGS. Variations in crop sequence since 1983 are presented in Table 9-14. Monitoring site 29 was discontinued after the 1983 growing season because of vandalism; it was replaced by monitoring site 45 beginning in 1984. During the monitoring period, cotton was the most consistently planted crop in the vicinity of PVNGS, with short-staple cotton being the most commonly planted variety. In 1991, short-staple cotton was planted at sites 12, 13, and 30; long-staple cotton was not planted at any monitoring site in 1991.

Alfalfa has been the second most frequently planted crop in the vicinity of PVNGS. This legume generally remains in production for 4 to 5 years and may be harvested up to four times per year. Monitoring site 43 has been planted in alfalfa since 1983. This is the first time since 1988 that site 23 has been planted in alfalfa. Other crops that have been planted at monitored fields include barley, sorghum, and melon (Table 9-14).

9.3.1.1 Alfalfa

Because of crop rotations (Table 9-14), the comparison of ionic concentrations of alfalfa leaf tissue for the preoperational period and 1991 was limited to monitoring site 43 (Table 9-15). Sodium, potassium, magnesium, sulfate, and fluoride showed no significant difference between mean ionic concentrations for the preoperational period and 1991. The mean concentrations of calcium and chloride were significantly higher in 1991 than during the preoperational period, while the opposite was true for nitrate and phosphate. Because site 43, a control, lies well beyond the range of predicted drift deposition from PVNGS, the increase in ionic concentration for calcium and chloride in 1991 is unrelated to the operation of PVNGS.

9.3.1.2 Cotton

The preoperational and 1991 ionic content of short-staple cotton leaf phytomass was evaluated at three monitoring sites (Table 9-16). Sodium

levels at site 12 were significantly higher in 1991 than during the preoperational period, while there was no significant difference at sites 13 and 30. Mean ionic concentrations of potassium and calcium were significantly higher in 1991 than during the 1983-1985 period at all sites. There was no significant difference in magnesium levels between the monitoring periods at sites 12 and 13; however, levels at site 30 were significantly higher in 1991 than during the preoperational period. At sites 12 and 13 chloride and sulfate levels were significantly higher in 1991 than during the preoperational period, while at site 30 they were not significantly different. The mean concentration of nitrate did not vary significantly between monitoring periods at any of the sites. Phosphate levels were significantly higher during the preoperational period than in 1991 at site 12; there was no significant difference between monitoring periods at sites 13 and 30. The mean concentration of fluoride was greater in 1991 than during the 1983-1985 period at site 12, while the opposite was true at site 30. At site 13 there was no significant difference in fluoride levels between the monitoring periods.

9.3.1.3 Cotton Yield

The mean cotton yields for the period 1983-1991 at agricultural monitoring sites in the vicinity of PVNGS are presented in Table 9-17. A comparison of 1991 yields with preoperational (i.e., 1983-1985) data is possible for sites 12, 13, and 30. Site 12 was planted in short-staple cotton from 1983 through 1985. It was then fallow until 1991 when short-staple cotton was again planted. Site 13 has been planted in short-staple cotton since 1984. Site 30 has been planted in a variety of crops since the study began in 1983, including melons, alfalfa, barley, and short-staple cotton.

The mean cotton yield for site 12 in 1991 was not significantly different from that for 1984, but was significantly higher than that for 1985. At site 13 the 1991 cotton yield was found not to be significantly different than that reported for 1984. Cotton yield at site 30 was not significantly different in 1991 from that reported in 1985.

The grand mean cotton yields at sites 12 and 13 were higher for the operational period (3,405 and 3,653 pounds per acre, respectively) than they

were for the preoperational period (2,551 and 3,201 pounds per acre, respectively). The opposite was the case at site 30 where the grand mean cotton yield was slightly lower during the operational period (2,413 pounds per acre) than for the preoperational period (2,470 pounds per acre).

Final statistics for 1991 cotton yields in Arizona were unavailable at the time this report was written. However, the cotton harvest forecast provides estimates of average statewide yield of 1,190 pounds per acre for short-staple cotton and 885 pounds per acre for long-staple cotton (Kenerson, 1992). This represents an increase in yield for both varieties relative to the 1990 yields. These values represent 85 and 87 percent, respectively, of the 1987 record harvest for short-staple and long-staple cotton. Historically, estimates of yield from Halliburton NUS field studies have been higher than those compiled by the U.S. Department of Agriculture, Arizona Agricultural Statistics Service, because the removal of cotton lint by hand is a more complete process than mechanical harvesting.

9.3.2 Native Vegetation

Native vegetation was monitored at eight locations on or near PVNGS. Sites 1, 4, 6, 40, and 42 are creosote bush communities, while sites 2, 3, and 44 are salt bush communities. Sites 40, 42, and 44 are controls which are located sufficiently far from the PVNGS so as not to be influenced by cooling tower drift.

9.3.2.1 Creosote Bush

The preoperational and 1991 ionic content of creosote bush leaf tissue was evaluated at five monitoring sites (Table 9-18). Mean concentrations of sodium and magnesium showed no significant change at any site between the preoperational period and 1991. Levels of potassium were significantly higher in 1991 than in 1983-1985 at sites 1, 4, and 6; there was no significant difference at sites 40 and 42. Calcium levels were significantly higher at sites 4 and 6 in 1991 than during the preoperational period. Calcium values for sites 1, 40, and 42 did not change significantly between monitoring periods. Mean concentrations of chloride showed no significant difference between monitoring period at sites 1, 4, and 42. At site 6, 1991

chloride values were significantly higher than 1983-1985 values, while the opposite was true at site 40. Sulfate (except at site 40 where a comparison was not possible) and nitrate values were significantly higher during the preoperational period than in 1991. The mean concentration of phosphate at site 4 was significantly higher in 1991 than 1983-1985; the opposite was the case at site 42. Phosphate values were not significantly different between monitoring periods at sites 1, 6, and 40. Fluoride levels were significantly higher in 1991 than during the preoperational period at all sites.

An analysis of the phytosociological structure of the five creosote bush communities for the preoperational and operational periods is presented in Table 9-19. Generally, the perennial shrub stratum was monotypic, with creosote bush being the dominant shrub at each site. The operational cover values for creosote bush presented in Table 9-19 are equal to or lower than those presented in the 1990 Annual Report (NUS, 1991a). Further, coverage values for the operational period are lower than those for the preoperational period for all sites. As in the past, the cover values for creosote bush break down into two groups: higher for sites 1, 6, and 42 and lower for sites 4 and 40.

Fifty-nine species of herbaceous flora have been tabulated since studies were initiated. Based on overall percent cover, dominant species within the study plots include _Amsinckia intermedia_, _Erodium texanum_, _Euphorbia_ spp., _Lepidium lasiocarpum_, _Plantago insularis_, and _Sphaeralcea Coulteri_. However, coverage values for both _Euphorbia_ spp. and _Sphaeralcea Coulteri_ were not distributed evenly between sites and monitoring periods. Of the ten species of grass that were identified, _Festuca octoflora_ and _Schismus_ spp. were seen most often within the study plots. Five species of cacti were enumerated; most belonged to the genus _Opuntia_.

Between 1.4 and 2.2 times as many species were recorded during the operational monitoring period than during the preoperational period. This observation is not surprising, given the different lengths of the two periods: 6 years for the operational period versus 3 years for the preoperational period. Onsite monitoring locations (sites 1, 4, and 6) had markedly higher species richness than control sites 40 and 42. Heterogeneity was similar between operational and preoperational periods at sites 1 and 4,

but it was higher in 1986-1991 at monitoring sites 6, 40, and 42. A comparison of similarity indices for the preoperational and operational periods indicates that of the onsite monitoring locations, site 4 had the highest similarity. As for the offsite control locations, site 42 had the highest similarity index.

9.3.2.2 Salt Bush

The preoperational and 1991 ionic content of salt bush leaf tissue is presented in Table 9-20. Mean concentrations of sodium and potassium were significantly greater at sites 2 and 3 in 1991 than during the preoperational period; at site 44 there was no significant difference. Levels of calcium and magnesium for the two periods showed no significant differences at any location. Chloride levels were significantly higher during the 1983-1985 period than in 1991 at site 44; there was no significant difference in chloride levels at sites 2 and 3. Mean concentrations of sulfate and nitrate were significantly higher during the preoperational period than in 1991 at all sites. Phosphate values were significantly higher in 1991 than 1983-1985 at site 3, while there was no significant difference between monitoring periods at sites 2 and 44. All fluoride concentrations were significantly higher in 1991 than during the preoperational period.

Salt bush (Atriplex polycarpa) was the dominant species at each site during both the preoperational and operational monitoring periods (Table 9-21). Percent cover of salt bush for the operational period was slightly higher at sites 2 and 3, and lower at site 44 than that of the preoperational period. Salt bush coverage in 1991 was higher at sites 2 and 44 than in 1990 (NUS, 1991), at site 3 coverage was lower than in 1990. Forty-eight species of herbaceous plants have been identified since studies were begun. Based on percent cover, dominant herbaceous species include Euphorbia spp., Pectis papposa, Plantago insularis, and Sphaeralcea Coulteri. Of the six species of grass that were identified, Schismus spp. was seen most often within the study plots. No species of cacti were found in any of the salt bush communities.

Species richness within the salt bush communities was greater during the 1986-1991 monitoring period than the 1983-1985 period at all sites. Between

1.3 and 1.7 times as many species were recorded during the operational monitoring period than during the preoperational period. Heterogeneity was greater at sites 2 and 3 during the operational monitoring period than during the preoperational period; however, the opposite was true at site 44. The index of similarity was highest at site 3 and lowest at site 44.

9.4 SOILS ANALYSES

This section presents statistical comparisons of soils analysis data at each of the 44 monitoring sites to determine if significant differences exist between 1991 and the preoperational period. Each soil sample was analyzed for 19 parameters, six of which were chosen as indicator parameters for the comparison of preoperational and 1991 data: electrical conductivity and soluble calcium, magnesium, sodium, potassium, and chloride. Indicator parameters were chosen on the basis of their expected concentration in cooling tower basin water, their importance as plant nutrients or potential toxins, and the probability of their being found in detectable concentrations in drift deposition. For each of these parameters, mean values were calculated for individual sites using all sample data from 1991 and from 1983 through 1985, the operational and preoperational periods, respectively.

As described in the report for 1986 (NUS, 1987a), linear regression equations were used to normalize the results obtained from the 1983 and 1984 analytical methods to those obtained from subsequent (and current) analytical methods for the purpose of comparing the preoperational and 1991 data.

Statistical comparisons of the data were computed with the Student's t-statistic, using a 95-percent confidence level, to test for significant differences between mean values of each indicator parameter. Mean values for individual monitoring locations were compared using the t-test, as were group means for all agricultural and native sites.

9.4.1 Agricultural Soils

Preoperational and 1991 mean values and standard errors for each indicator parameter for agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45) are presented in Table 9-22. Only potassium was significantly different

in 1991 from the preoperational period. The mean value for potassium was significantly lower in 1991.

The mean concentrations of indicator parameters for individual agricultural sites are given in Table 9-23. A comparison between preoperational and 1991 means shows that there were no significant differences for any of the indicator parameters at sites 24, 43, and 45. A significant increase in electrical conductivity was observed in 1991 for sites 11, 13, 25, and 31, and a significant decrease was observed for sites 7, 12, 30, and 32. No significant differences in electrical conductivity were observed at five sites. Mean calcium values in 1991 were significantly higher at sites 13, 25, 28, and 31 and significantly lower at sites 12, 23, and 30. No significant differences were observed for calcium at six sites. Mean concentrations of magnesium in 1991 were significantly higher at sites 11, 13, and 25 and significantly lower at sites 12, 23, and 30. No significant differences in magnesium concentrations were observed at seven sites. Sodium concentrations significantly increased at sites 11 and 31 and significantly decreased at sites 7, 12, 30, and 32 in 1991. No significant change in sodium content was observed at seven sites. Potassium concentrations were observed to be significantly higher in 1991 over preoperational values at sites 11 and 13 and significantly lower at sites 12, 23, and 30. No significant differences in potassium concentrations were observed at eight sites. Chloride concentrations were significantly higher in 1991 at sites 11, 13, and 31 and significantly lower at sites 7, 12, 23, 30, and 32. No significant differences in chloride concentrations were observed at five sites.

Monitoring locations which showed significant increases in one or more indicator parameters are found northwest (site 11), north-northwest (site 13), south-southeast (site 31), and southwest (site 28) of the PVNGS site. The closest of these (site 11) is 2.0 miles from the centroid of the PVNGS cooling towers. A remote (control) site, site 25 (west-northwest and 19.0 miles from the towers), also exhibited significant increases in three parameters. Four of these locations (sites 11, 25, 28, and 31) were fallow fields and one (site 13) was planted in cotton in 1991. Sites that showed significant decreases in one or more indicator parameters are found northwest

(site 12), east-northeast (site 7), southeast (site 32), south-southwest (site 30), and southwest (site 23) of the PVNGS site. Three of these locations (sites 7, 30, and 32) were fallow, site 12 was planted in cotton, and site 23 was planted in alfalfa in 1991.

These findings continue to indicate that significant changes in soluble salt content, as indicated by soil ion content at the agricultural monitoring sites, appear to reflect no spatial trend. It is most likely that irrigation practices, crop selection, and fertilizer application account for the statistical differences in the ion content of agricultural soils.

9.4.2 Native Soils

Table 9-24 presents the means and standard errors, based on 29 native sites, for each indicator parameter measured in 1991 and the preoperational period. Sites 3 and 16 were not used in calculating the means because they were identified as statistical outliers for several parameters (see Chapter 8). The results of the t-test analysis indicate that the electrical conductivity and the soluble ions of sodium and chloride were significantly different in 1991 as compared to the preoperational period. In 1991, all three parameters were significantly higher.

Mean values for individual native sites for the preoperational period and 1991 are given in Table 9-25. There was no significant difference between preoperational and 1991 values for any parameter at 11 of the 31 native sites (1, 2, 3, 6, 8, 16, 27, 33, 39, 41, and 44). These include six onsite locations (sites 1, 2, 3, 6, 16, and 27) as well as sites up to 11.5 miles away (site 39). Electrical conductivity values in 1991 were significantly higher than preoperational values at sites 17, 38, and 40 and significantly lower at sites 15, 26, and 37. No significant differences were found at the remaining 25 sites. Calcium concentrations were significantly higher during 1991 at four sites (sites 5, 14, 17, and 42) and significantly lower at sites 9 and 10. There were no significant differences in calcium values at 25 of the 31 native sites. Magnesium values were significantly higher during 1991 at sites 14 and 17 and significantly lower at sites 9, 10, and 37. There were no significant differences at the remaining 26 sites. Sodium concentrations increased significantly in 1991 over preoperational values at

sites 14, 38, and 40 and decreased significantly at site 26. There were no significant differences in sodium concentration at 27 of the 31 native sites. Potassium values were significantly higher during 1991 at sites 17 and 21 and significantly lower at sites 4, 10, 15, 22, 26, 34, 35, 36, 37, and 42. There were no differences at the remaining 19 sites. Chloride concentrations were significantly greater in 1991 than in the preoperational period at 12 sites (sites 4, 10, 14, 17, 18, 19, 20, 22, 34, 35, 37, and 42) and not significantly different at the other 19 native sites.

Sites 3, 14, 16, and 20 are the nearest soil monitoring sites to the cooling towers. It is expected that the soils at these sites would be the first to show effects of drift from the cooling towers. In particular, sites 16 and 20 would be expected to exhibit maximum deposition effects based on prevailing drift deposition modeling trends. The only indicator parameters showing a significant change at these four sites were potassium and chloride. Potassium concentrations were significantly lower in 1991 than in the preoperational period at site 4 while chloride was significantly higher at sites 4 and 20. Similar significant changes in these indicator parameters were also observed at the two sites farthest from the PVNGS site (sites 37 and 42). Specifically, potassium concentrations in 1991 were significantly lower than preoperational values at sites 37 and 42 while chloride concentrations were significantly higher at both sites. This analysis would seem to indicate that there are influences on soil concentrations other than cooling tower drift deposition.

9.5 REMOTE SENSING/AERIAL PHOTOGRAPHY

Specifications and discussion of the 1991 color infrared photomission for PVNGS and its environs are presented in Section 7. Vegetative stress in agricultural crops and indigenous vegetation may be attributable to drought, poor drainage, nutrient deficiencies associated with varying soil fertility, disease or insect damage, weed competition, and other conditions that alter the normal physiology of a plant. Symptom conditions associated with salt deposition or uptake include chlorosis and necrosis of the leaves, shoot-tip dieback, leaf curl, slower growth, increased susceptibility to disease and insect damage, and changes in the structure and diversity in the plant community over time. Significant vegetative stress from drift deposition

would appear on the color infrared imagery as a homogeneous tonal signature covering an entire field or a large portion thereof.

A comparison of the color infrared imagery for the preoperational period and 1991 revealed similar growth patterns at the monitoring sites. Areas of stress revealed by the 1991 photography proved to be a result of nitrogen deficiency. Texas root rot was not prevalent in any of the sites monitored in 1991. Salt stress symptoms such as chlorosis (except that associated with nitrogen deficiency at site 13) and necrosis of the leaves were not observed during ground-truthing. Patterns of agricultural vegetative growth in PVNGS operational years have been consistent with those observed in preoperational years, suggesting that the observed variability was related not to PVNGS but rather to factors such as soil fertility, drainage, and agricultural practices.

9.6 SUMMARY AND CONCLUSIONS

As in the prior years of this program, the results obtained from elements of the 1991 drift monitoring program have been compared with the corresponding preoperation values as well as with each other and with the results of computer models. In a number of instances there are clear indications of the effects of the drift emissions from the PVNGS cooling towers. This is particularly true for deposition samples at locations close to the towers and out to a distance of about 1 mile from the centroid of the Unit 2 tower cluster.

Beyond the unambiguous evidence of drift deposition, however, the 1991 results from the other program elements are not indicative of the influence of cooling tower emissions. As in the prior years of the program, although there are a number of samples in 1991 showing statistically significant changes in specific ion concentrations in soils, native vegetation, and crop samples, the changes are not consistent with any spatial or temporal patterns that can be correlated with PVNGS operations.

In accordance with the practice in prior annual reports, the changes from preoperational values for four analytes in deposition, soils, and crop

samples were compiled for the agricultural sites, and are summarized in Table 9-26. A review of this table indicates that:

1. In 1991, no cultivated site displayed significant changes in the same parameter for all media sampled. Site 23 displayed an increase in measured deposition of all four analytes, but concentrations of the same analytes in soil samples either decreased (calcium, magnesium, and potassium) or remained unchanged (sodium); a change in crop prevented comparisons of vegetation concentrations.

2. The major constituent in drift, sodium, showed either decreased deposition or no change from the preoperational period at all agricultural sites except for site 23.

3. Site 11, the closest of the agricultural sites, which had shown consistent increases in leaf tissue content of several drift constituent ions over the background period in each of the previous 5 years, was fallow in 1991. As in prior years, deposition in 1991 showed either a decrease or no change from the preoperational period; soil concentrations at this site showed an increase from the same period for sodium, potassium, and magnesium.

For 1991, as it has in prior years, the monitoring program has more quantitatively confirmed the common onsite observation of drift deposition in the immediate vicinity of the cooling towers, as well as at somewhat greater distances, largely but not entirely confined to the PVNGS site. However, deposition levels at locations beyond the developed areas of the site cannot be correlated with changes in soil and/or vegetation concentrations of the same ions at those locations, nor can any soil structure or crop effects be identified that are attributable to the deposition measured in the offsite area.

Since its inception in 1983, the objective of the salt drift monitoring program for PVNGS has been to identify any evidence of adverse impacts of the cooling tower drift emissions on the environment around the plant. The initial programmatic concern was directed at ensuring that crops cultivated on adjacent farmlands were not adversely affected by these emissions. It was

felt, based on the literature, that to the extent any vegetation was affected, such crops were likely to be more vulnerable than the vegetation native to the area. The results of the studies over the intervening years have sought but failed to find any evidence that any of the crops on nearby farms were in any way adversely affected by the drift emissions. Quantities of drift emitted by the towers would need to increase by more than a factor of 10 over the current levels before crops at adjacent farmed areas would begin to be affected.

The monitoring program studies of the native vegetation have also confirmed the absence of impacts of drift deposition on these species. The sampling of these sparse communities required by the program, however, coupled with the slow growth and recovery rates of these communities, has resulted in the diminution of native vegetation cover in the sample plots. To the extent it is felt necessary to include such sampling in any future programs, this factor should be a consideration in its design.

The soil sampling element of this program has not provided the contribution to useful information anticipated at the outset. It was hoped to be able to correlate measured deposition of particular ions with changes in the concentrations of those ions in soils at the same locations. However, the inhomogeneity of the soils, the extreme variability of their chemical compositions, and the sensitivity of the results to immediate pre-sampling precipitation events frustrated that anticipation.

The drift deposition measurements, despite their associated logistical problems, have provided the most consistent and reproducible parameter in the program. The ability to provide a quantitative estimate of the areal drift deposition density has been a key element in demonstrating both the existence of cooling tower drift deposition at a location and its magnitude relative to other locations (including control locations) and to a preoperational "background." The addition of supplementary deposition monitoring stations in the immediate vicinity of the towers has provided an unambiguous confirmation of the ability of the sampling method to detect tower drift, as well as to confirm the magnitude of drift deposition increases associated with tower deterioration.

From an impact perspective, perhaps the most significant adverse effect of the cooling tower drift is on the structures, facilities, and equipment at PVNGS itself. The deposited drift can be expected to affect painted finishes, to provide a potential for electrical arcs, and to corrode metals. The incentive to maintain the cooling towers and minimize drift is likely to be driven more by economic than by environmental considerations.

Table 9-1. Monthly average meteorological data for PVNGS, 1991 versus 1974-1985

Month	Temperature (°F)*		Dew point (°F)*		Precipitation (in.)†		Wind speed (mph)*	
	1991	1974-1985	1991	1974-1985	1991	1974-1985	1991	1974-1985
January	52	52	30	33	2.23	0.58	4.8	4.8
February	62	56	25	32	0.41	0.59	6.1	5.5
March	57	61	34	34	1.96	0.82	7.4	6.7
April	68	68	25	31	0.00	0.19	7.2	7.3
May	76	78	26	35	0.00	0.12	8.1	7.7
June	85	89	29	37	0.00	0.03	6.7	7.7
July	92	92	48	57	0.07	0.64	8.0	7.8
August	91	90	53	56	1.75	0.53	7.1	7.1
September	84	85	53	53	0.47	0.59	6.4	6.8
October	76	72	36	42	0.20	0.60	6.0	5.6
November	59	59	31	33	0.83	0.74	5.6	5.1
December	54	52	39	33	0.58	0.70	5.0	4.6
Annual	71	71	36	40	8.50	6.13	6.5	6.4

*Based on measurement at 35 feet.

†Annual precipitation is sum of monthly totals.

Table 9-2. Monthly average meteorological data for NWS Phoenix, 1991 versus 1950-1980

Month	Temperature (°F)* 1991	Temperature (°F)* 1950-1980	Dew point (°F)* 1991	Dew point (°F)* 1950-1980‡	Precipitation (in.) 1991	Precipitation (in.) 1950-1980	Wind speed (mph)† 1991	Wind speed (mph)† 1950-1980
January	56	52	33	--	0.63	0.73	4.0	5.3
February	66	56	31	--	0.56	0.59	5.6	5.9
March	60	61	34	--	2.05	0.81	7.1	6.7
April	72	68	29	--	0.00	0.27	7.0	7.0
May	80	77	31	--	0.00	0.14	7.4	7.1
June	88	87	37	--	T	0.17	5.8	6.9
July	95	92	51	--	0.14	0.74	6.9	7.1
August	95	90	56	--	0.12	1.02	6.9	6.6
September	89	85	54	--	0.81	0.64	6.4	6.3
October	80	73	42	--	1.16	0.63	5.6	5.9
November	64	61	35	--	1.25	0.54	5.3	5.4
December	57	53	41	--	1.63	0.83	4.8	5.2
Annual	75	71	40	--	8.35	7.11	6.1	6.3

*Based on measurement at 5 feet.

†Based on measurement at 33 feet.

‡National Weather Service does not keep climatological records of dew point.

T=Trace amount

Table 9-3. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural monitoring sites, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 770)	1991 (n = 286)
Sodium	7.9 ± 0.3	6.3 ± 0.4
Potassium	8.6 ± 0.4	6.2 ± 0.5
Calcium	23.6 ± 0.8[a]	24.9 ± 2.1[a]
Magnesium	6.3 ± 0.3[a]	6.6 ± 0.7[a]
TSS	575.4 ± 29.2[a]	568.3 ± 51.6[a]

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-4. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS agricultural monitoring sites, preoperational period and 1991 (means ± standard errors)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1991	Preoperational*	1991	Preoperational*	1991
7	4.9 ± 0.6[a]	4.1 ± 0.5[a]	5.1 ± 0.5	2.0 ± 0.3	16.8 ± 1.6	12.2 ± 1.2
11	6.7 ± 0.6[a]	6.1 ± 0.7[a]	8.6 ± 0.8	3.7 ± 0.5	21.1 ± 1.7	13.8 ± 1.8
12	7.9 ± 1.2[a]	8.8 ± 1.9[a]	6.0 ± 0.9[a]	9.2 ± 2.0[a]	13.4 ± 1.2[a]	15.4 ± 1.7[a]
13	7.0 ± 0.9[a]	6.4 ± 1.0[a]	6.3 ± 0.7[a]	7.3 ± 2.2[a]	20.4 ± 2.4[a]	22.1 ± 5.1[a]
23	6.8 ± 0.8	11.5 ± 1.5	12.7 ± 1.6	22.4 ± 3.6	37.8 ± 4.0	95.0 ± 14.5
24	7.9 ± 1.2	4.4 ± 0.4	7.9 ± 1.3	2.9 ± 0.6	20.8 ± 2.9	10.8 ± 1.3
25	8.1 ± 1.0	3.1 ± 0.3	11.3 ± 1.0	3.8 ± 0.6	32.4 ± 2.1	14.9 ± 2.0
28	5.6 ± 0.5[a]	4.1 ± 0.8[a]	4.9 ± 0.6[a]	3.1 ± 0.7[a]	26.7 ± 3.2	17.7 ± 2.1
30	9.6 ± 0.8[a]	11.6 ± 3.0[a]	11.5 ± 1.4[a]	9.9 ± 1.8[a]	39.5 ± 3.5[a]	39.6 ± 9.7[a]
31	8.6 ± 0.7	4.3 ± 0.6	5.7 ± 0.6	2.6 ± 0.5	15.3 ± 1.3[a]	14.9 ± 4.8[a]
32	8.0 ± 0.8[a]	6.9 ± 1.1[a]	6.6 ± 0.8[a]	7.1 ± 1.9[a]	18.3 ± 1.8[a]	27.6 ± 9.5[a]
43	9.8 ± 1.1[a]	8.1 ± 0.6[a]	9.9 ± 1.1	4.8 ± 0.6	12.3 ± 1.0	18.7 ± 2.0
45	12.4 ± 1.6	4.4 ± 0.6	19.6 ± 5.2	3.1 ± 0.3	39.5 ± 7.5[a]	24.1 ± 2.5[a]

Key: For individual ions at each site, means with superscript "a" are not significantly different at 95-percent confidence level.

*May 1983 through December 1985.

Table 9-5. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 1835)	1991 (n = 826)
Sodium	5.7 ± 0.1	10.7 ± 0.7
Potassium	4.3 ± 0.1	2.8 ± 0.1
Calcium	11.1 ± 0.3[a]	11.5 ± 0.3[a]
Magnesium	2.6 ± 0.1[a]	2.5 ± 0.1[a]
TSS	228.2 ± 5.7[a]	230.5 ± 6.3[a]

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-6. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS supplemental monitoring sites, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 662)	1991 (n = 96)
Sodium	5.7 ± 0.2	32.9 ± 4.0
Potassium	4.3 ± 0.2[a]	4.0 ± 0.3[a]
Calcium	13.0 ± 0.5	23.1 ± 2.0
Magnesium	3.1 ± 0.2	4.7 ± 0.4
TSS	248.2 ± 12.0	364.1 ± 28.1

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-7. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS native monitoring sites (excluding supplemental sites) within 1 mile of PVNGS, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 206)	1991 (n = 94)
Sodium	6.0 ± 0.3	22.6 ± 2.9
Potassium	4.7 ± 0.3[a]	3.9 ± 0.4[a]
Calcium	16.4 ± 1.1[a]	14.9 ± 0.8[a]
Magnesium	3.9 ± 0.4[a]	3.2 ± 0.2[a]
TSS	307.7 ± 22.2[a]	271.1 ± 16.2[a]

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-8. Annual mean deposition (lb/(acre)(yr)) of drift constituents at native monitoring sites 1 to 2 miles from PVNGS, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 381)	1991 (n = 142)
Sodium	5.7 ± 0.3	8.2 ± 0.4
Potassium	3.9 ± 0.2	2.5 ± 0.2
Calcium	11.1 ± 0.5[a]	10.2 ± 0.3[a]
Magnesium	2.5 ± 0.1[a]	2.2 ± 0.1[a]
TSS	206.6 ± 9.7[a]	201.4 ± 11.6[a]

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-9. Annual mean deposition (lb/(acre)(yr)) of drift constituents at native monitoring sites more than 2 miles from PVNGS, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 1233)	1991 (n = 494)
Sodium	5.6 ± 0.2	4.8 ± 0.2
Potassium	4.4 ± 0.1	2.4 ± 0.1
Calcium	10.3 ± 0.3	9.0 ± 0.2
Magnesium	2.4 ± 0.1	2.0 ± 0.1
TSS	221.7 ± 7.0[a]	205.2 ± 7.39[a]

Key: TSS, total suspended solids.

*May 1983 through December 1985.

Note: For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-10. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors) (sheet 1 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1991	Preoperational*	1991	Preoperational*	1991
1	5.4 ± 0.6	10.3 ± 1.3	4.0 ± 0.5	2.4 ± 0.3	10.4 ± 0.7[a]	10.5 ± 0.9[a]
2	5.9 ± 0.6	9.3 ± 1.2	4.1 ± 0.5[a]	3.0 ± 0.5[a]	9.2 ± 0.7[a]	9.9 ± 0.9[a]
3	6.4 ± 0.6	11.7 ± 1.3	5.2 ± 0.6	3.3 ± 0.4	15.8 ± 2.8[a]	16.3 ± 1.1[a]
4	5.1 ± 0.6[a]	6.8 ± 0.7[a]	4.7 ± 0.7[a]	4.8 ± 1.0[a]	10.8 ± 1.1[a]	10.5 ± 0.8[a]
5	5.5 ± 0.6[a]	6.4 ± 0.8[a]	4.2 ± 0.6[a]	2.8 ± 0.7[a]	13.5 ± 1.9	8.6 ± 0.7
6	6.6 ± 0.6[a]	7.6 ± 0.7[a]	3.4 ± 0.3	2.4 ± 0.3	10.6 ± 1.0[a]	10.3 ± 0.9[a]
8	5.7 ± 0.7[a]	5.8 ± 0.6[a]	4.5 ± 0.8	2.1 ± 0.3	9.3 ± 1.0[a]	9.3 ± 0.9[a]
9	6.0 ± 0.7[a]	8.1 ± 1.1[a]	4.4 ± 0.5	2.8 ± 0.3	11.8 ± 1.5[a]	11.7 ± 0.7[a]
10	5.1 ± 0.6	7.4 ± 0.9	3.3 ± 0.3	1.9 ± 0.2	11.1 ± 1.3[a]	10.4 ± 0.9[a]
14	6.5 ± 0.8	16.1 ± 2.4	4.7 ± 0.5[a]	3.6 ± 0.6[a]	22.5 ± 2.0[a]	19.9 ± 1.9[a]
15	5.7 ± 0.6	3.9 ± 0.5	4.0 ± 0.4	2.1 ± 0.2	9.4 ± 0.7[a]	9.9 ± 0.9[a]
16	5.8 ± 0.7	19.2 ± 4.0	3.6 ± 0.4[a]	2.8 ± 0.4[a]	12.2 ± 1.1[a]	13.2 ± 1.2[a]
17	6.3 ± 0.9[a]	4.8 ± 0.7[a]	5.7 ± 0.6	1.8 ± 0.2	13.2 ± 1.5[a]	8.5 ± 1.7[a]
18	4.6 ± 0.5	7.5 ± 1.2	3.3 ± 0.3	2.1 ± 0.2	9.4 ± 0.9[a]	8.1 ± 0.9[a]
19	5.3 ± 0.7	10.1 ± 1.5	5.4 ± 0.6[a]	3.6 ± 0.6[a]	13.4 ± 1.3[a]	12.4 ± 1.8[a]
20	4.9 ± 0.6	42.8 ± 9.4	5.3 ± 0.7[a]	5.7 ± 1.5[a]	11.7 ± 0.9[a]	10.3 ± 1.0[a]
21	5.8 ± 1.0[a]	5.7 ± 0.7[a]	3.9 ± 0.4	2.6 ± 0.4	14.9 ± 3.6[a]	9.5 ± 0.8[a]
22	4.7 ± 0.5[a]	4.1 ± 0.6[a]	4.1 ± 0.6	1.9 ± 0.1	9.0 ± 0.6[a]	8.3 ± 0.6[a]
26	6.4 ± 0.9[a]	4.8 ± 0.8[a]	3.5 ± 0.4	2.1 ± 0.4	9.8 ± 0.7[a]	8.9 ± 0.9[a]
27	5.4 ± 0.5[a]	5.3 ± 0.7[a]	5.3 ± 0.7	2.1 ± 0.2	14.0 ± 2.3	7.9 ± 0.7
33	6.0 ± 0.6	3.9 ± 0.6	5.2 ± 0.6	3.0 ± 0.6	11.5 ± 1.1[a]	10.4 ± 0.7[a]
34	5.7 ± 0.6	4.0 ± 0.6	4.0 ± 0.5	2.4 ± 0.5	7.5 ± 0.6[a]	8.0 ± 0.8[a]
35	5.8 ± 0.9[a]	4.0 ± 0.6[a]	6.0 ± 0.8	3.4 ± 0.4	11.5 ± 1.3[a]	9.8 ± 0.8[a]
36	4.9 ± 0.6[a]	3.3 ± 0.6[a]	3.4 ± 0.3	1.9 ± 0.2	6.9 ± 0.5[a]	7.1 ± 0.8[a]

Table 9-10. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors) (sheet 2 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1991	Preoperational*	1991	Preoperational*	1991
37	5.5 ± 0.7[a]	3.6 ± 0.7[a]	3.7 ± 0.5	2.0 ± 0.2	7.1 ± 0.5[a]	6.1 ± 0.7[a]
38	6.2 ± 0.7	3.5 ± 0.7	5.1 ± 0.7	1.7 ± 0.2	8.6 ± 0.7[a]	10.3 ± 2.2[a]
39	6.0 ± 0.8[a]	4.2 ± 0.9[a]	4.3 ± 0.6	1.9 ± 0.2	9.0 ± 0.8[a]	8.0 ± 0.8[a]
40	6.0 ± 0.7	3.4 ± 0.6	4.5 ± 0.4[a]	3.6 ± 0.5[a]	12.8 ± 1.0[a]	11.0 ± 0.9[a]
41	6.2 ± 0.9[a]	5.5 ± 0.8[a]	4.7 ± 0.8	1.9 ± 0.2	11.9 ± 1.5[a]	9.2 ± 0.8[a]
42	5.3 ± 0.6[a]	3.6 ± 0.8[a]	3.7 ± 0.7	1.5 ± 0.1	7.6 ± 0.5[a]	7.6 ± 0.8[a]
44	6.0 ± 1.0	3.5 ± 0.4	3.4 ± 0.6[a]	2.4 ± 0.3[a]	7.8 ± 0.7[a]	8.7 ± 0.8[a]
80	5.7 ± 0.2	25.1 ± 4.3	4.3 ± 0.2[a]	3.9 ± 0.7[a]	13.0 ± 0.5	33.4 ± 6.8
81	5.7 ± 0.2	56.3 ± 13.4	4.3 ± 0.2[a]	5.5 ± 1.0[a]	13.0 ± 0.5	20.4 ± 1.7
82	5.7 ± 0.2	21.3 ± 3.5	4.3 ± 0.2	3.4 ± 0.4	13.0 ± 0.5[a]	15.8 ± 2.1[a]
83	5.7 ± 0.2	28.8 ± 5.1	4.3 ± 0.2	3.3 ± 0.4	13.0 ± 0.5	22.7 ± 1.7

Key: For individual ions at each site, means with superscript "a" are not significantly different at 95-percent confidence level.

*May 1983 through December 1985.

Table 9-11. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural and native monitoring control sites, preoperational period and 1991 (means ± standard errors)

Parameter	Agricultural control sites (sites 25* and 43) Preoperational† (n = 120)	Agricultural control sites (sites 25* and 43) 1991 (n = 43)	Native control sites (sites 40 and 42) Preoperational† (n = 119)	Native control sites (sites 40 and 42) 1991 (n = 48)
Sodium	8.9 ± 0.7	5.4 ± 0.5	5.7 ± 0.5	3.5 ± 0.5
Potassium	10.6 ± 0.7	4.3 ± 0.4	4.1 ± 0.4	2.6 ± 0.3
Calcium	22.5 ± 1.5	16.7 ± 1.5	10.4 ± 0.6[a]	9.3 ± 0.6[a]
Magnesium	7.4 ± 0.6	4.7 ± 0.7	2.9 ± 0.3[a]	2.4 ± 0.2[a]
TSS	728.9 ± 57.4	421.2 ± 64.7	264.1 ± 22.9[a]	252.6 ± 27.4[a]

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*Site was fallow in 1991.

†May 1983 through December 1985.

Table 9-12. Net drift deposition (lb/(acre)(yr)) for PVNGS onsite monitoring sites, 1991 (means ± standard errors)

	Deposition			
Site	Sodium 1991	Sodium preoperational*	Net sodium 1991	Net TDS 1991†
1	10.3 ± 1.3	5.4 ± 0.6	4.9 ± 1.4	15.7 ± 4.5
2	9.3 ± 1.2	5.9 ± 0.6	3.4 ± 1.3	10.9 ± 4.2
3	11.7 ± 1.3	6.4 ± 0.6	5.3 ± 1.4	17.0 ± 4.5
4	6.8 ± 0.7	5.1 ± 0.6	1.7 ± 0.9	5.4 ± 2.9
5	6.4 ± 0.8	5.5 ± 0.6	0.9 ± 1.0	2.9 ± 3.2
6	7.6 ± 0.7	6.6 ± 0.6	1.0 ± 0.9	3.2 ± 2.9
10	7.4 ± 0.9	5.1 ± 0.6	2.3 ± 1.1	7.4 ± 3.5
14	16.1 ± 2.4	6.5 ± 0.8	9.6 ± 2.5	30.7 ± 8.0
16	19.2 ± 4.0	5.8 ± 0.7	13.4 ± 4.1	42.9 ± 13.1
20	42.8 ± 9.4	4.9 ± 0.6	37.9 ± 9.4	121.3 ± 30.1
27	5.3 ± 0.7	5.4 ± 0.5	-0.1 ± 0.9	-0.3 ± 2.7
80	25.1 ± 4.3	5.7 ± 0.2	19.4 ± 4.3	62.1 ± 13.8
81	56.3 ± 13.4	5.7 ± 0.2	50.6 ± 13.4	161.9 ± 42.9
82	21.3 ± 3.5	5.7 ± 0.2	15.6 ± 3.5	49.9 ± 11.2
83	28.8 ± 5.1	5.7 ± 0.2	23.1 ± 5.1	73.9 ± 16.3

*May 1983 through December 1985.

†Based on scaling measured sodium deposition at each monitoring site by ratio of total dissolved solids to sodium (3.2 ± 0.04) as determined from monthly 1991 cooling tower basin water samples from Units 1-3.

Table 9-13. Measured versus predicted drift deposition (lb/(acre)(year)) at PVNGS onsite monitoring sites, 1991

Site	Net deposition* (measured)	FOG-code-predicted total deposition	Measured/ predicted (ratio)
1	15.7 ± 4.5	16.30	0.96
2	10.9 ± 4.2	12.90	0.84
3	17.0 ± 4.5	16.80	1.01
4	5.4 ± 2.9	9.76	0.55
5	2.9 ± 3.2	2.64	1.10
6	3.2 ± 2.9	3.47	0.92
10	7.4 ± 3.5	8.86	0.84
14	30.7 ± 8.0	51.40	0.60
16	42.9 ± 13.1	458.00	0.09
20	121.3 ± 30.1	92.50	1.31
27	-0.3 ± 2.7†	11.20	NC
80	62.1 ± 13.8	322.00	0.19
81	161.9 ± 42.9	11,800.00	0.01
82	49.9 ± 11.2	219.00	0.23
83	73.9 ± 16.3	126.00	0.59
Mean ratio			0.66

Key: NC, not calculated.

*Means ± standard errors.

†Not significantly different from zero.

Note: Correlation analysis based on following equation:

$$y = A + BX$$

where

y = measured deposition
A = -962.0 (intercept)
B = 45.6 (slope)
X = predicted deposition
Correlation coefficient (R^2) = 0.52

Table 9-14. Sequence of crops planted at PVNGS agricultural monitoring sites, 1983-1991

Monitoring site	1983	1984	1985	1986	1987	1988	1989	1990	1991
7	SS cotton	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
11	SS cotton	SS cotton*	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	Fallow
12	SS cotton	SS cotton	SS cotton	Fallow	Fallow	Fallow	Fallow	Fallow	SS cotton
13	Sorghum	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton
23	SS cotton	SS cotton	SS cotton	Alfalfa	Alfalfa	Alfalfa	LS cotton	SS cotton	Alfalfa
24	Fallow	LS cotton*	LS cotton	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
25	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	Fallow	Fallow
28	Fallow	SS cotton*	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
29†	Alfalfa	--	--	--	--	--	--	--	--
30	Melon	Fallow	Barley/ SS cotton	SS cotton	Alfalfa	SS cotton	SS cotton	SS cotton*	SS cotton*
31	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	LS cotton	Fallow	Fallow	Fallow
32	SS cotton	SS cotton	SS cotton	Fallow	SS cotton	LS cotton	Fallow	Fallow	Fallow
43	Alfalfa	Alfalfa‡	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
45§	--	SS cotton	Alfalfa	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow

Key: SS cotton, short-staple (upland) cotton; LS cotton, long-staple (Pima) cotton.

*Monitoring site was fallow; field in immediate vicinity was sampled.

†Discontinued after 1983 growing season.

‡Planted, but not sampled.

§Established in 1984.

Table 9-15. Preoperational and 1991 mean ion content ($\mu g/g$ dry weight) of alfalfa leaf tissue at PVNGS monitoring site 43 (means ± standard errors)

Ion	1983, 1985 (n = 40)	1991 (n = 20)
Sodium	1,547 ± 129[a]	1,705 ± 98[a]
Potassium	22,194 ± 944[a]	20,761 ± 410[a]
Calcium	12,026 ± 424	15,041 ± 766
Magnesium	2,705 ± 77[a]	2,683 ± 77[a]
Chloride	11,951 ± 606	16,270 ± 371
Sulfate	11,283 ± 1,080[a]	10,233 ± 707[a]
Nitrate (as N)	302 ± 59	97 ± 17
Phosphate (as P)	3,010 ± 91	2,564 ± 64
Fluoride	14.1 ± 1.7[a]	11.5 ± 0.5[a]

Key: For individual ions, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-16. Preoperational and 1991 ionic content (µg/g dry weight) of short-staple cotton leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 12		Site 13		Site 30	
	1983-1985	1991	1984-1985	1991	1985	1991
Sodium	2,030 ± 136 (n = 60)	2,726 ± 433 (n = 20)	3,310 ± 271[a] (n = 40)	4,168 ± 462[a] (n = 20)	2,553 ± 208[a] (n = 20)	2,128 ± 82[a] (n = 20)
Potassium	18,733 ± 526 (n = 60)	25,464 ± 929 (n = 20)	16,943 ± 592 (n = 40)	23,770 ± 788 (n = 20)	17,423 ± 781 (n = 20)	26,539 ± 690 (n = 20)
Calcium	27,639 ± 946 (n = 60)	43,340 ± 1,538 (n = 20)	33,836 ± 1,038 (n = 40)	41,720 ± 932 (n = 20)	38,103 ± 1,587 (n = 20)	45,938 ± 731 (n = 20)
Magnesium	4,764 ± 109[a] (n = 60)	4,442 ± 93[a] (n = 20)	5,378 ± 170[a] (n = 40)	5,026 ± 200[a] (n = 20)	5,463 ± 227 (n = 20)	6,211 ± 178 (n = 20)
Chloride	14,791 ± 525 (n = 60)	20,190 ± 383 (n = 20)	16,377 ± 597 (n = 40)	24,140 ± 530 (n = 20)	21,350 ± 1,573[a] (n = 20)	19,740 ± 336[a] (n = 20)
Sulfate	27,811 ± 1,549 (n = 60)	40,762 ± 3,033 (n = 20)	33,600 ± 1,741 (n = 40)	43,000 ± 2,144 (n = 20)	41,513 ± 3,240[a] (n = 20)	45,818 ± 2,694[a] (n = 20)
Nitrate (as N)	905 ± 84[a] (n = 50)	1,069 ± 206[a] (n = 20)	715 ± 136[a] (n = 32)	864 ± 142[a] (n = 20)	1,341 ± 302[a] (n = 20)	1,219 ± 247[a] (n = 20)
Phosphate (as P)	3,056 ± 141 (n = 60)	2,445 ± 99 (n = 20)	1,831 ± 103[a] (n = 40)	2,058 ± 132[a] (n = 20)	2,018 ± 185[a] (n = 20)	2,299 ± 106[a] (n = 20)
Fluoride	9.7 ± 1.1 (n = 35)	16.0 ± 0.8 (n = 20)	142 ± 64[a] (n = 24)	16.0 ± 0.9[a] (n = 20)	29.4 ± 5.3 (n = 20)	17.8 ± 1.6 (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-17. Mean cotton yield (lb/acre) at PVNGS agricultural monitoring sites, 1983-1991 (means ± standard errors)

Monitoring site	1983	1984	1985	1986	1987	1988	1989	1990	1991
7	749 ± 127	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
11	2,514 ± 184^{a}	ND*	ND	ND	3,736 ± 225	2,535 ± 188^{a}	2,450 ± 337^{a}	2,561 ± 194^{a}	Fallow
12	ND	2,786 ± 148^{ab}	2,314 ± 206^{a}	Fallow	Fallow	Fallow	Fallow	Fallow	3,405 ± 376^{b}
13	Sorghum	3,201 ± 99^{ab}	ND	3,029 ± 194^{a}	3,608 ± 170^{b}	4,610 ± 204^{c}	4,549 ± 168^{c}	2,538 ± 143	3,583 ± 137^{b}
23	2,463 ± 304^{a}	1,375 ± 128^{b}	1,894 ± 299^{ab}	Alfalfa	Alfalfa	Alfalfa	2,968 ± 198†	3,666 ± 191	Alfalfa
24	Fallow	948 ± 57^{a}	1,423 ± 356^{a}	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
25	2,088 ± 162^{bc}	1,460 ± 68^{a}	2,880 ± 220^{d}	1,970 ± 354^{abc}	1,733 ± 167^{ab}	1,925 ± 142^{abc}	2,343 ± 139^{cd}	Fallow	Fallow
28	Fallow	1,595 ± 64	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
30	Melon	Fallow	2,470 ± 163^{ab}	1,569 ± 52^{c}	Alfalfa	3,051 ± 479^{a}	2,633 ± 323^{ab}	2,676 ± 207^{ab}	2,135 ± 63^{bc}
31	1,860 ± 210	1,330 ± 178^{a}	1,169 ± 142^{a}	1,205 ± 78^{a}	1,229 ± 72^{a}	684 ± 146‡	Fallow	Fallow	Fallow
32	1,316 ± 173^{a}	2,486 ± 189	2,002 ± 213	Fallow	866 ± 89^{a}	379 ± 90‡	Fallow	Fallow	Fallow
43	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
45	NA§	2,294 ± 184	Alfalfa	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow

Key: For yields at same site, means with same superscript letter are not significantly different at 95-percent confidence level.

*No data; field harvested prior to sampling.

†Not comparable with other sample data, since long-staple cotton was planted in 1989 and short-staple cotton was planted in all other years.

‡Not directly comparable with data for previous years, since long-staple cotton was planted in 1988 and short-staple cotton was planted earlier.

§Data not available; site established in 1984.

Note: Each site value was derived from analysis of 10 samples.

Table 9-18. Preoperational and 1991 ionic content (μg/g dry weight) of creosote bush (<u>Larrea divaricata</u>) leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 1 1983-1985	Site 1 1991	Site 4 1983-1985	Site 4 1991	Site 6 1983-1985	Site 6 1991	Site 40 1983-1985	Site 40 1991	Site 42 1983-1985	Site 42 1991
Sodium	309 ± 28[a] (n = 50)	384 ± 30[a] (n = 20)	357 ± 27[a] (n = 50)	399 ± 26[a] (n = 20)	291 ± 26[a] (n = 49)	275 ± 16[a] (n = 20)	403 ± 108[a] (n = 49)	295 ± 15[a] (n = 20)	304 ± 28[a] (n = 41)	295 ± 18[a] (n = 20)
Potassium	8,589 ± 448 (n = 50)	12,169 ± 386 (n = 20)	13,876 ± 488 (n = 50)	16,456 ± 620 (n = 20)	10,579 ± 538 (n = 50)	14,639 ± 464 (n = 20)	11,154 ± 678[a] (n = 50)	13,081 ± 401[a] (n = 20)	10,906 ± 639[a] (n = 50)	12,186 ± 505[a] (n = 20)
Calcium	16,117 ± 694[a] (n = 50)	18,155 ± 538[a] (n = 20)	13,307 ± 307 (n = 50)	15,212 ± 618 (n = 20)	16,972 ± 503 (n = 50)	18,864 ± 816 (n = 20)	17,250 ± 3,010[a] (n = 50)	15,451 ± 415[a] (n = 20)	16,348 ± 1,816[a] (n = 50)	19,065 ± 560[a] (n = 20)
Magnesium	1,523 ± 59[a] (n = 50)	1,442 ± 47[a] (n = 20)	1,388 ± 39[a] (n = 50)	1,296 ± 45[a] (n = 20)	1,681 ± 62[a] (n = 50)	1,538 ± 87[a] (n = 20)	1,424 ± 94[a] (n = 50)	1,442 ± 56[a] (n = 20)	1,488 ± 89[a] (n = 50)	1,503 ± 48[a] (n = 20)
Chloride	6,086 ± 259[a] (n = 50)	6,700 ± 256[a] (n = 20)	6,462 ± 347[a] (n = 50)	7,588 ± 400[a] (n = 20)	6,609 ± 244 (n = 50)	8,380 ± 208 (n = 20)	6,691 ± 277 (n = 50)	4,720 ± 230 (n = 20)	7,072 ± 324[a] (n = 50)	7,310 ± 254[a] (n = 20)
Sulfate	17,538 ± 1,687 (n = 50)	2,858 ± 813 (n = 9)	8,680 ± 528 (n = 50)	4,943 ± 835 (n = 13)	8,894 ± 550 (n = 50)	4,746 ± 777 (n = 16)	11,484 ± 744 (n = 50)	*	15,042 ± 1,548 (n = 50)	3,818 ± 489 (n = 10)
Nitrate (as N)	1,373 ± 317 (n = 39)	118 ± 12 (n = 20)	436 ± 73 (n = 40)	162 ± 29 (n = 20)	389 ± 61 (n = 39)	124 ± 19 (n = 20)	433 ± 70 (n = 39)	35 ± 3 (n = 20)	439 ± 65 (n = 38)	76 ± 14 (n = 20)
Phosphate (as P)	969 ± 28[a] (n = 50)	1,054 ± 63[a] (n = 20)	1,106 ± 35 (n = 50)	1,349 ± 35 (n = 20)	1,411 ± 42[a] (n = 50)	1,483 ± 80[a] (n = 20)	1,464 ± 72[a] (n = 50)	1,400 ± 100[a] (n = 20)	1,330 ± 41 (n = 50)	1,151 ± 55 (n = 20)
Fluoride	14.8 ± 1.4 (n = 30)	31.7 ± 1.7 (n = 20)	13.0 ± 1.6 (n = 29)	22.6 ± 1.6 (n = 20)	12.4 ± 1.4 (n = 32)	21.6 ± 0.8 (n = 20)	12.6 ± 1.4 (n = 30)	20.3 ± 0.5 (n = 20)	14.3 ± 1.1 (n = 30)	20.3 ± 0.3 (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level

*All values were below the detection limit

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (*Larrea divaricata*) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 1 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover											
Shrubs											
Ambrosia dumosa†	White bursage‡	1.1	1.7								
Larrea divaricata	Creosote bush; greasewood	18.2	16.3	13.4	12.2	20.2	17.6	12.4	12.2	17.4	16.8
Herbs											
Allionia incarnata	Trailing four-o'clock; windmills				--				0.4		
Amsinckia intermedia	Coast fiddleneck	0.5	0.2	<0.1	<0.1	1.4	0.7	--	0.1	0.1	0.1
Argythamnia neomexicana	None	--	--								
Astragalus Nuttallianus	Nuttall locoweed			<0.1	0.1	<0.1	<0.1		<0.1		<0.1
Bowlesia incana	Hairy bowlesia		<0.1								
Brassica Tournefortii	Mustard		<0.1	--	0.2		<0.1		<0.1		
Camelina microcarpa	Little pod			<0.1							
Camissonia sp.	Evening primrose						--				
Chaenactis carphoclinia	Pebble pincushion	0.2	0.1	0.2	0.1					--	<0.1
Chaenactis Fremontii	Fremont pincushion		--		<0.1						--
Chorizanthe brevicornu	Brittle spine flower		--		<0.1		<0.1				--
Chorizanthe rigida	Rigid spiny herb	<0.1	--	0.1	<0.1		<0.1				--
Cryptantha angustifolia	Narrow-leaved cryptantha			<0.1	--	<0.1					
Cryptantha inaequata	Darwin cryptantha	<0.1									
Cryptantha maritima	White-haired cryptantha		<0.1				--			0.1	<0.1
Cryptantha muricata	None		--				--				

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 2 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)											
Herbs (continued)											
Cryptantha pterocarya	None		<0.1								
Cryptantha sp.	None		--		<0.1		<0.1				--
Dalea mollis	Silk dalea						<0.1				--
Dalea neomexicana	Indigo bush; pea bush									0.1	<0.1
Daucus pusillus	American carrot	--	0.8								
Eriastrum diffusum	None	<0.1									
Erigeron lobatus	Fleabane		--								
Eriogonum Thomasii	Thomas eriogonum	0.1	<0.1	<0.1	0.1	--	0.1			--	0.2
Eriogonum trichopes	Little trumpet			0.1	<0.1	<0.1	<0.1		--	0.8	0.1
Eriophyllum lanosum	Woolly eriophyllum	0.1	--			<0.1	<0.1				
Erodium cicutarium	Filaree; heron bill		0.2		<0.1		0.1		<0.1		
Erodium texanum	Large-flowered stork's bill; heron bill	0.9	0.5	0.1	0.1	0.1	<0.1			<0.1	<0.1
Eucrypta chrysanthemifolia	Torrey eucrypta						<0.1				
Euphorbia polycarpa	Small-seeded sand mat		<0.1		--	--	<0.1		0.1		--
Euphorbia sp.	Spurge				--	--	<0.1	2.0			
Filago arizonica	Arizona filago	0.1	--				<0.1				
Hesperocallis undulata	Desert lily			<0.1	<0.1						
Lepidium lasiocarpum	Sand pepper grass	0.2	0.1	0.1	0.1	0.1	0.1		<0.1	0.7	0.2
Lepidium virginicum	Pepper grass; pepperwort	--	<0.1	--	<0.1	--	0.1	--	--	--	0.1
Lepidium sp.	Pepper grass; pepperwort		--		--		--		--		--

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 3 of 5)

Parameter		Site 1 Preop	Site 1 Op	Site 4 Preop	Site 4 Op	Site 6 Preop	Site 6 Op	Site 40 Preop	Site 40 Op	Site 42 Preop	Site 42 Op
Species composition and percent cover (continued)											
Herbs (continued)											
Lesquerella Gordoni	Gordon bladderpod				0.3			--	0.2		--
Linanthus bigelovii	None		<0.1				<0.1				
Linanthus dichotomus	Evening snow	0.1				<0.1					
Lotus salsuginosus	Deer vetch				--						<0.1
Lotus tomentellus	Hairy lotus				<0.1	<0.1	<0.1				<0.1
Lupinus sparsiflorus	Lupine					0.1	0.1				
Machaeranthera Coulteri§	None		<0.1		--		<0.1				
Monoptilon bellioides	Mohave desert star		<0.1				<0.1		--		
Nemacladus glanduliferus	Thread plant	0.1									
Oenothera sp.	Evening primrose; sun drops						--				
Oligomeris linifolia	Linear-leaved cambess	<0.1		--	<0.1						
Orthocarpus purpurascens	Mohave owl clover		--	--	<0.1		--				<0.1
Pectis papposa	Chinchweed	--	--	--	<0.1	--	<0.1	<0.1	0.1		
Pectocarya platycarpa	Broad-nutted comb bur	0.2	<0.1	0.2	<0.1	0.1	0.3		0.1	0.2	<0.1
Perityle Emoryi	Emory rock daisy						--				
Phacelia crenulata	None	<0.1	0.1	--	<0.1						
Pholistoma auritum	None						<0.1				
Plantago insularis	Woolly plantain; Indian wheat	1.1	1.3	3.5	4.3	0.5	3.8	8.1	2.7	0.7	2.1
Sisymbrium Irio	London rocket								--		
Spermolepis echinata	Scale seed	0.6									

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (*Larrea divaricata*) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 4 of 5)

Parameter		Site 1 Preop	Site 1 Op	Site 4 Preop	Site 4 Op	Site 6 Preop	Site 6 Op	Site 40 Preop	Site 40 Op	Site 42 Preop	Site 42 Op
Species composition and percent cover (continued)											
Herbs (continued)											
Sphaeralcea Coulteri	Coulter globe mallow							16.0	0.2		
Sphaeralcea sp.	Alkali pink								<0.1		
Tidestromia lanuginosa	Woolly tidestromia				<0.1				0.1		
Grasses											
Aristida adscensionis	Six weeks three-awn	--	0.1		<0.1		0.7				<0.1
Aristida sp.	Three-awn	--									
Bouteloua barbata	Six-weeks grama	--	0.1	--	--	--	<0.1	--	--		
Bromus rubens	Red brome; foxtail chess	--	0.2		--	--	0.5	--			
Erioneuron pulchellum	Fluff grass		--								
Festuca octoflora	Six-weeks fescue	0.4	0.2			0.4	0.1				--
Muhlenbergia microsperma	Littleseed muhly		--								
Schismus arabicus	Arabian grass		<0.1	--	0.3		0.2		0.9		0.3
Schismus barbatus	Mediteranean grass	0.6	0.1	1.8	0.1	<0.1	0.1	0.3	1.5	0.7	0.3
Schismus sp.	None		0.1		0.3		1.2		2.0		0.5
Cacti											
Echinocereus Englemannii	Hedgehog cactus; strawberry cactus				--						

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 5 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)											
Cacti (continued)											
Opuntia acanthocarpa	Buckhorn cholla			0.3	<0.1	--				--	--
Opuntia echinocarpa	Silver cholla; golden cholla			0.1	0.1						--
Opuntia leptocaulis	Desert Christmas cactus	--	--								
Opuntia ramosissima	Diamond cholla			0.5	0.5					--	--
Species diversity and number of plots											
Species richness		30	43	26	42	23	41	11	24	15	32
Heterogeneity (H')		.52	.52	.52	.51	.26	.55	.54	.62	.32	.36
Index of similarity (%)		63		74		63		51		64	
Plots		53	120	50	120	50	120	50	120	50	120

Key: -- (dash), species present in plot but not on transect.

†Scientific name.

‡Common name. Names have been updated using Lehr, 1978.

§Machaeranthera arida is now recognized as the same species as Machaeranthera Coulteri.

Table 9-20. Preoperational and 1991 ionic content (μg/g dry weight) of salt bush (*Atriplex polycarpa*) leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 2		Site 3		Site 44	
	1983-1985	1991	1983-1985	1991	1984-1985	1991
Sodium	48,721 ± 1,077 (n = 50)	57,372 ± 1,813 (n = 20)	51,417 ± 1,296 (n = 50)	65,120 ± 1,465 (n = 20)	33,564 ± 1,082[a] (n = 40)	35,341 ± 1,360[a] (n = 20)
Potassium	13,328 ± 888 (n = 50)	21,182 ± 1,181 (n = 20)	17,207 ± 969 (n = 50)	24,245 ± 1,142 (n = 20)	22,612 ± 1,324[a] (n = 40)	23,601 ± 1,285[a] (n = 20)
Calcium	11,887 ± 1,153[a] (n = 50)	11,537 ± 675[a] (n = 20)	13,333 ± 1,767[a] (n = 50)	11,621 ± 862[a] (n = 20)	9,175 ± 346[a] (n = 40)	9,749 ± 468[a] (n = 20)
Magnesium	4,359 ± 257[a] (n = 50)	5,113 ± 217[a] (n = 20)	5,721 ± 243[a] (n = 50)	5,379 ± 252[a] (n = 20)	8,038 ± 1,831[a] (n = 40)	6,284 ± 240[a] (n = 20)
Chloride	59,225 ± 4,683[a] (n = 50)	50,640 ± 1,653[a] (n = 20)	60,440 ± 3,691[a] (n = 50)	54,030 ± 1,970[a] (n = 20)	40,428 ± 2,445 (n = 40)	33,156 ± 1,130 (n = 20)
Sulfate	8,914 ± 659 (n = 50)	6,132 ± 948 (n = 17)	7,550 ± 623 (n = 50)	3,418 ± 455 (n = 18)	11,200 ± 1,072 (n = 40)	5,028 ± 485 (n = 20)
Nitrate (as N)	342 ± 49 (n = 44)	140 ± 21 (n = 20)	386 ± 55 (n = 45)	141 ± 13 (n = 20)	372 ± 54 (n = 33)	153 ± 23 (n = 20)
Phosphate (as P)	1,324 ± 183[a] (n = 50)	1,320 ± 139[a] (n = 20)	979 ± 43 (n = 50)	1,261 ± 65 (n = 20)	1,437 ± 74[a] (n = 40)	1,270 ± 65[a] (n = 20)
Fluoride	7.7 ± 0.6 (n = 30)	16.6 ± 0.8 (n = 20)	7.9 ± 0.7 (n = 32)	13.1 ± 0.4 (n = 20)	8.4 ± 0.6 (n = 30)	12.3 ± 0.3 (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 1 of 4)

Parameter		Site 2 Preop	Site 2 Op	Site 3 Preop	Site 3 Op	Site 44 Preop	Site 44 Op
Species composition and percent cover							
Shrubs							
Ambrosia dumosa*	White bursage†			0.1	<0.1		
Atriplex linearis	Salt bush, narrow-leaf wingscale	0.5	0.5	1.5	1.0	0.4	
Atriplex polycarpa	Salt bush, all scale	18.9	19.1	20.0	20.7	13.1	8.4
Larrea divaricata	Cresote bush; greasewood	4.9	4.8			0.8	0.6
Lycium Fremontii	Fremont thornbush	0.1	0.3	1.3	3.2		
Lycium sp.	Wolf-berry; desert thorn	0.3	0.1	5.4	1.4		
Prosopis velutina	Velvet mesquite	3.9	5.9		--		0.7
Herbs							
Abronia villosa	Hairy sand verbena	<0.1					
Allionia incarnata	Trailing four-o'clock; windmills	--	<0.1				--
Amaranthus crassipes	Amaranth; pig weed		--				
Amaranthus fimbriatus	Fringed amaranth	0.1	<0.1	<0.1	--		
Amsinckia intermedia	Coast fiddleneck	0.1	0.1	--	<0.1	<0.1	--
Boerhaavia intermedia	Five-winged ringstem		0.1				
Brassica Tournefortii	Mustard						--
Chaenactis carphoclinia	Pebble pincushion	--					
Cryptantha angustifolia	Narrow-leaved cryptantha			--			
Cryptantha inaequata	Darwin cryptantha				<0.1		
Cryptantha maritima	White-haired cryptantha				--		
Eremalche exilis	None						--
Eriastrum diffusum	None			<0.1	<0.1		

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (*Atriplex* sp.) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 2 of 4)

Parameter		Site 2 Preop	Site 2 Op	Site 3 Preop	Site 3 Op	Site 44 Preop	Site 44 Op
		Species composition and percent cover (continued)					
Herbs (continued)							
Erigeron lobatus	Fleabane		--				
Eriogonum Thomasii	Thomas eriogonum	--					
Eriogonum trichopes	Little trumpet						--
Eriophyllum lanosum	Woolly eriophyllum	0.2	<0.1	<0.1	<0.1		
Erodium cicutarium	Filaree; heron bill				--		
Erodium texanum	Large-flowered stork's bill; heron bill		--				--
Eucrypta chrysanthemifolia	Torrey eucrypta				--		
Eucrypta micrantha	Small-flowered eucrypta					<0.1	
Euphorbia capitellata	Spurge	--					
Euphorbia polycarpa	Small-seeded sand mat		1.1		0.2		0.1
Euphorbia sp.	Spurge	<0.1	0.1	0.3	<0.1	6.2	<0.1
Lepidium lasiocarpum	Sand pepper grass	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Lepidium virginicum	Pepper grass; pepperwort	--	<0.1	--	<0.1	--	<0.1
Lepidium sp.	Pepper grass; pepperwort		--		--		
Lesquerella Gordoni	Gordon bladderpod	--					
Linanthus bigelovii	None		--				
Machaeranthera Coulteri‡	None	<0.1	<0.1	<0.1	<0.1		
Monoptilon bellioides	Mohave desert star		--		--		
Nama demissum	Purple mat		--		--		
Nama hispidum	None			<0.1			
Oligomeris linifolia	Linear-leaved cambess	--	<0.1	--	0.1		--
Orthocarpus purpurascens	Mohave owl clover	--				--	
Pectis papposa	Chinchweed	0.1	0.1	0.2	0.3	0.3	<0.1
Pectocarya platycarpa	Broad-nutted comb bur		<0.1	--	<0.1		<0.1

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (*Atriplex* sp.) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 3 of 4)

Parameter		Site 2		Site 3		Site 44	
		Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)							
Herbs (continued)							
Phacelia crenulata	None				--		
Plantago insularis	Woolly plantain; Indian wheat	1.1	1.6	0.3	0.7	2.5	0.5
Portulaca parvula	Purslane		--		--		
Proboscidea altheaefolia	Desert unicorn plant; elephant tusks	0.1					
Salsola Kali	Russian thistle				--		
Sisymbrium Irio	London rocket		--		--		
Sphaeralcea Coulteri	Coulter globe mallow	1.8	0.1	<0.1	<0.1	7.2	0.1
Sphaeralcea sp.	Alkali pink		0.1		--		<0.1
Thelypodium lasiophyllum	None				--		
Tidestromia lanuginosa	Woolly tidestromia		--			--	<0.1
Trianthema Portulacastrum	Horse purslane	<0.1	<0.1		<0.1		
Grasses							
Aristida adscensionis	Six-weeks three-awn		<0.1				
Bouteloua barbata	Six-weeks gamma	0.3	0.1	0.9	0.2		
Festuca octoflora	Six-weeks fescue	--		0.1			
Schismus arabicus	Arabian grass		1.6		1.9		2.4
Schismus barbatus	Mediteranean grass	2.1	0.6	6.8	2.1	7.2	1.3
Schismus sp.	None		3.0		3.3		5.2

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1991) periods at PVNGS monitoring sites (sheet 4 of 4)

Parameter	Site 2		Site 3		Site 44	
	Preop	Op	Preop	Op	Preop	Op
Species diversity and number of plots						
Species richness	29	38	23	38	14	23
Heterogeneity (H')	.67	.75	.62	.67	.72	.67
Index of similarity (%)	63		66		59	
Plots	50	120	50	120	50	120

Key: -- (dash), species present in plot but not on transect.

*Scientific name.

†Common name. Names have been updated using Lehr, 1978.

‡Since Machaeranthera arida and Machaeranthera Coulteri are now recognized as one species, all data have been combined.

Table 9-22. Electrical conductivity and concentrations of soluble ions in soils at PVNGS agricultural monitoring sites, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational* (n = 404)	1991 (n = 156)
Electrical conductivity (mmhos/cm)	1.40 ± 0.06	1.41 ± 0.08
Soluble ions (ppm)		
Calcium	48 ± 3	46 ± 3
Magnesium	7.0 ± 0.4	7.4 ± 0.8
Sodium	266 ± 10	259 ± 15
Potassium†	26 ± 1	18 ± 1
Chloride	173 ± 12	171 ± 15

*May 1983 through December 1985.

†Means for preoperational period and 1991 are significantly different at 95-percent confidence level.

Table 9-23. Electrical conductivity and ion content of soil at PVNGS agricultural monitoring sites, preoperational period and 1991 (means ± standard errors)

Site†	Electrical conductivity (mmhos/cm)		Soluble calcium (ppm)		Soluble magnesium (ppm)	
	Preoperational*	1991	Preoperational*	1991	Preoperational*	1991
7	1.17 ± 0.14[a]	0.51 ± 0.03[a]	31 ± 2	38 ± 5	6.0 ± 0.5	5.6 ± 0.5
11	1.35 ± 0.12[a]	1.84 ± 0.12[a]	44 ± 4	46 ± 4	3.7 ± 0.3[a]	5.2 ± 0.5[a]
12	1.89 ± 0.20[a]	1.01 ± 0.09[a]	63 ± 8[a]	32 ± 3[a]	9.6 ± 1.4[a]	2.9 ± 0.3[a]
13	0.96 ± 0.07[a]	1.45 ± 0.16[a]	21 ± 2[a]	40 ± 5[a]	2.8 ± 0.2[a]	5.7 ± 0.9[a]
23	1.27 ± 0.12	1.03 ± 0.08	56 ± 7[a]	33 ± 5[a]	6.2 ± 0.7[a]	3.8 ± 0.5[a]
24	0.89 ± 0.04	1.12 ± 0.11	31 ± 2	34 ± 3	4.0 ± 0.4	4.9 ± 0.5
25	0.98 ± 0.07[a]	1.61 ± 0.14[a]	66 ± 8[a]	138 ± 15[a]	9.0 ± 0.8[a]	25.8 ± 3.2[a]
28	0.71 ± 0.04	0.67 ± 0.05	20 ± 2[a]	29 ± 4[a]	2.3 ± 0.3	2.6 ± 0.3
30	3.82 ± 0.30[a]	2.13 ± 0.09[a]	157 ± 17[a]	53 ± 5[a]	22 ± 2[a]	7.3 ± 0.5[a]
31	0.87 ± 0.05[a]	1.92 ± 0.16[a]	19 ± 2[a]	28 ± 4[a]	3.9 ± 0.9	2.7 ± 0.3
32	1.26 ± 0.09[a]	0.86 ± 0.05[a]	26 ± 7	23 ± 4	2.8 ± 0.4	4.8 ± 1.2
43	1.65 ± 0.22	2.91 ± 0.68	66 ± 9	84 ± 22	14 ± 2	23 ± 7
45	1.31 ± 0.11	1.33 ± 0.21	17 ± 2	20 ± 3	3.3 ± 0.7	2.4 ± 0.3

Site†	Soluble sodium (ppm)		Soluble potassium (ppm)		Chloride (ppm)	
	Preoperational*	1991	Preoperational*	1991	Preoperational*	1991
7	231 ± 30[a]	76 ± 6[a]	11 ± 1	13 ± 2	103 ± 28[a]	25 ± 5[a]
11	235 ± 19[a]	335 ± 28[a]	32 ± 3[a]	41 ± 2[a]	153 ± 21[a]	289 ± 30[a]
12	361 ± 43[a]	186 ± 16[a]	80 ± 8[a]	35± 1[a]	299 ± 46[a]	119 ± 17[a]
13	197 ± 21	264 ± 34	17 ± 1[a]	27 ± 2[a]	120 ± 16[a]	234 ± 40[a]
23	254 ± 26	215 ± 19	18 ± 1[a]	8.3 ± 0.8[a]	153 ± 28[a]	89 ± 13[a]
24	166 ± 9	202 ± 22	34 ± 2	29± 2	65 ± 8	94 ± 17
25	124 ± 9	149 ± 8	28 ± 2	31 ± 2	59 ± 9[a]	124 ± 21[a]
28	148 ± 8	131 ± 7	9.4 ± 0.7	9.2 ± 0.8	35 ± 4	41 ± 6
30	694 ± 51[a]	389 ± 21[a]	52 ± 5[a]	11 ± 1[a]	696 ± 63[a]	330 ± 23[a]
31	189 ± 11[a]	401 ± 31[a]	7.9 ± 0.6	9.3 ± 0.7	79 ± 11[a]	267 ± 34[a]
32	294 ± 24[a]	202 ± 13[a]	4.3 ± 0.4	4.2 ± 1.2	124 ± 17[a]	48 ± 6[a]
43	289 ± 35	528 ± 132	28 ± 3	18 ± 6	241 ± 38	484 ± 119
45	295 ± 23	287 ± 36	6.8 ± 1.6	3.8 ± 0.2	99 ± 19	78 ± 21

Key: For individual parameters at each site, means with superscript "a" are significantly different at 95-percent confidence level.

*May 1983 through December 1985.

†Number of samples was 12 for each site in 1991; it was 32 for each site except site 45 (n = 20) in preoperational period.

Table 9-24. Electrical conductivity and concentrations of soluble ions in soils at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors)

Parameter	Preoperational (n = 576)	1991 (n = 232)
Electrical conductivity (mmhos/cm)†	0.59 ± 0.03	0.73 ± 0.05
Soluble ions (ppm)		
Calcium	44 ± 2	47 ± 2
Magnesium	5.1 ± 0.3	5.1 ± 0.3
Sodium†	70 ± 5	98 ± 10
Potassium	22 ± 1	23 ± 2
Chloride†	50 ± 6	90 ± 11

†Means for preoperational period and 1991 are significantly different at 95-percent confidence level.

Notes:
1. Preoperational period is defined as May 1983 through December 1985 for all sites except sites 16 and 20, for which it is May 1983 through December 1984.
2. Measurements for sites 3 and 16 are not included in calculations.

Table 9-25. Electrical conductivity and ion content of soil at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors) (sheet 1 of 2)

Site	Electrical conductivity (mmhos/cm)		Soluble calcium (ppm)		Soluble magnesium (ppm)	
	Preoperational	1991	Preoperational	1991	Preoperational	1991
1	1.05 ± 0.16	1.53 ± 0.28	110 ± 18	121 ± 28	8.1 ± 1.0	8.5 ± 1.7
2	0.78 ± 0.22	0.77 ± 0.18	35 ± 6	32 ± 3	10 ± 5	6.0 ± 0.9
3	5.57 ± 1.15	6.11 ± 1.15	45 ± 8	39 ± 7	18 ± 6	7.6 ± 2.0
4	0.35 ± 0.02	0.33 ± 0.02	50 ± 3	50 ± 3	4.2 ± 0.3	3.8 ± 0.3
5	0.58 ± 0.03	0.98 ± 0.29	21 ± 2[a]	32 ± 5[a]	3.2 ± 0.3	3.8 ± 0.7
6	0.35 ± 0.02	0.33 ± 0.01	35 ± 3	33 ± 2	3.2 ± 0.3	2.5 ± 0.2
8	0.91 ± 0.17	1.55 ± 0.42	21 ± 2	24 ± 2	3.5 ± 0.3	3.9 ± 0.7
9	0.50 ± 0.04	0.47 ± 0.04	53 ± 6[a]	33 ± 2[a]	7.3 ± 0.4[a]	6.0 ± 0.3[a]
10	0.40 ± 0.03	0.38 ± 0.04	45 ± 6[a]	32 ± 2[a]	6.1 ± 0.6[a]	3.5 ± 0.3[a]
14	1.21 ± 0.31	1.36 ± 0.19	45 ± 6[a]	68 ± 8[a]	7.0 ± 0.5[a]	11 ± 1[a]
15	0.38 ± 0.03[a]	0.29 ± 0.01[a]	55 ± 5	47 ± 5	4.4 ± 0.3	3.9 ± 0.4
16	4.80 ± 1.12	7.30 ± 1.59	29 ± 3	39 ± 6	4.6 ± 0.5	6.8 ± 1.8
17	0.49 ± 0.05[a]	0.83 ± 0.08[a]	54 ± 5[a]	95 ± 6[a]	7.6 ± 1.6[a]	17 ± 2[a]
18	0.33 ± 0.02	0.32 ± 0.01	48 ± 3	51 ± 2	4.2 ± 0.3	3.8 ± 0.3
19	0.42 ± 0.02	0.52 ± 0.06	37 ± 2	44 ± 5	4.2 ± 0.2	5.5 ± 0.7
20	0.47 ± 0.03	0.51 ± 0.05	33 ± 8	23 ± 1	13 ± 5	4.5 ± 0.3
21	0.58 ± 0.08	0.81 ± 0.16	20 ± 2	26 ± 5	4.3 ± 0.6	8.8 ± 3.0
22	0.27 ± 0.02	0.28 ± 0.01	41 ± 2	37 ± 2	3.2 ± 0.2	2.8 ± 0.2
26	0.31 ± 0.02[a]	0.23 ± 0.01[a]	52 ± 7	54 ± 5	3.6 ± 0.2	3.5 ± 0.2
27	1.43 ± 0.27	1.33 ± 0.39	28 ± 3	25 ± 4	5.4 ± 1.2	5.5 ± 2.0
33	0.21 ± 0.02	0.18 ± 0.00	28 ± 2	40 ± 6	2.8 ± 0.2	3.3 ± 0.5
34	0.31 ± 0.02	0.28 ± 0.01	45 ± 3	52 ± 7	3.6 ± 0.2	3.3 ± 0.4
35	0.21 ± 0.02	0.19 ± 0.00	31 ± 2	42 ± 5	2.8 ± 0.1	2.5 ± 0.2
36	0.57 ± 0.14	0.53 ± 0.15	53 ± 8	55 ± 10	4.4 ± 0.6	3.4 ± 0.6
37	0.31 ± 0.02[a]	0.26 ± 0.01[a]	56 ± 4	58 ± 7	3.8 ± 0.2[a]	2.9 ± 0.4[a]
38	0.58 ± 0.05[a]	1.12 ± 0.21[a]	15 ± 4	16 ± 1	2.7 ± 0.5	2.6 ± 0.5
39	1 68 ± 0.36	2.10 ± 0.58	69 ± 25	35 ± 8	8.0 ± 2.9	5.0 ± 1.6
40	0.37 ± 0.02[a]	0.58 ± 0.08[a]	56 ± 2	76 ± 10	4.5 ± 0.2	6.5 ± 0.9
41	1 00 ± 0.21	1.58 ± 0.29	43 ± 8	49 ± 9	4.4 ± 0.3	3.9 ± 0.8
42	0 29 ± 0.02	0.28 ± 0.01	46 ± 2[a]	57 ± 4[a]	3.3 ± 0.2	3.5 ± 0.2
44	0.65 ± 0.06	1.23 ± 0.38	44 ± 14	46 ± 8	4.9 ± 0.5	8.6 ± 2.4

Table 9-25. Electrical conductivity and ion content of soil at PVNGS native monitoring sites, preoperational period and 1991 (means ± standard errors) (sheet 2 of 2)

Site	Soluble sodium (ppm) Preoperational	Soluble sodium (ppm) 1991	Soluble potassium (ppm) Preoperational	Soluble potassium (ppm) 1991	Chloride (ppm) Preoperational	Chloride (ppm) 1991
1	91 ± 17	114 ± 15	12 ± 1	11 ± 2	108 ± 26	210 ± 55
2	92 ± 20	121 ± 36	23 ± 3	20 ± 3	44 ± 14	80 ± 40
3	1111 ± 167	972 ± 165	32 ± 5	24 ± 1	1164 ± 210	1588 ± 308
4	10 ± 1	12 ± 1	16 ± 1[a]	13 ± 1[a]	8.7 ± 1.0[a]	16 ± 1[a]
5	104 ± 11	166 ± 47	15 ± 1	19 ± 3	21 ± 5	122 ± 62
6	40 ± 4	33 ± 4	4.4 ± 0.5	3.5 ± 0.5	12 ± 4	16 ± 1
8	174 ± 35	344 ± 102	26 ± 11	18 ± 3	148 ± 38	310 ± 96
9	35 ± 7	53 ± 9	40 ± 3	33 ± 4	31 ± 7	32 ± 7
10	30 ± 4	43 ± 11	14 ± 1[a]	10 ± 1[a]	15 ± 3[a]	29 ± 6[a]
14	63 ± 7[a]	106 ± 16[a]	93 ± 6	99 ± 15	38 ± 11[a]	122 ± 26[a]
15	9.6 ± 0.9	11 ± 2	25 ± 3[a]	15 ± 2[a]	12 ± 2	11 ± 1
16	1075 ± 192	999 ± 270	59 ± 8	70 ± 8	1048 ± 205	1512 ± 412
17	11 ± 1	13 ± 1	50 ± 8[a]	96 ± 12[a]	12 ± 1[a]	20 ± 2[a]
18	13 ± 1	15 ± 1	9.6 ± 0.9	7.8 ± 1.3	11 ± 1[a]	18 ± 2[a]
19	23 ± 4	31 ± 10	53 ± 2	70 ± 10	12 ± 1[a]	17 ± 3[a]
20	86 ± 8	104 ± 16	33 ± 3	31 ± 3	9.3 ± 0.8[a]	19 ± 2[a]
21	102 ± 18	164 ± 33	20 ± 1[a]	27 ± 3[a]	52 ± 15	71 ± 23
22	8 1 ± 0.7	9.5 ± 1.5	9.2 ± 0.8[a]	6.0 ± 0.7[a]	9.5 ± 1.9[a]	16 ± 1[a]
26	16 ± 1[a]	12 ± 1[a]	8.4 ± 0.8[a]	2.8 ± 0.5[a]	10 ± 1	13 ± 1
27	317 ± 54	262 ± 58	15 ± 1	16 ± 5	148 ± 49	156 ± 77
33	8.9 ± 2.7	6.5 ± 0.8	10 ± 1	8.3 ± 0.9	12 ± 4	12 ± 2
34	12 ± 1	14 ± 4	7.1 ± 0.4[a]	4.8 ± 0.6[a]	9.2 ± 1.1[a]	18 ± 1[a]
35	7.1 ± 0.4	6.3 ± 0.9	11 ± 1[a]	7.0 ± 0.7[a]	7.2 ± 1.0[a]	12 ± 1[a]
36	56 ± 18	64 ± 18	11 ± 1[a]	6.0 ± 0.9[a]	54 ± 24	64 ± 31
37	7.9 ± 0.8	9.3 ± 1.1	6.5 ± 0.7[a]	4.3 ± 0.4[a]	9.8 ± 1.8[a]	15 ± 1[a]
38	137 ± 16[a]	232 ± 37[a]	3.3 ± 0.2	2.5 ± 0.3	33 ± 8	121 ± 41
39	304 ± 58	399 ± 108	9.8 ± 1.3	5.8 ± 1.2	370 ± 104	476 ± 161
40	12 ± 1[a]	38 ± 4[a]	24 ± 1	21 ± 4	12 ± 1	30 ± 13
41	179 ± 45	262 ± 61	12 ± 1	9.3 ± 1.0	177 ± 51	352 ± 72
42	11 ± 1	11 ± 1	7.4 ± 0 4[a]	4.5 ± 1.1[a]	8.8 ± 1.5[a]	20 ± 4[a]
44	74 ± 15	177 ± 76	76 ± 5	98 ± 20	44 ± 11	203 ± 84

Key: For individual ions at each site, means with superscript "a" are significantly different at 95-percent confidence level.

Notes:

1 Preoperational period is defined as May 1983 through December 1985 except for sites 16 and 20, for which it is May 1983 through December 1984.

2. Number of samples was 8 for each site in 1991; it was 20 for all sites except site 44 (n = 16) in preoperational period.

Table 9-26. Deposition, soil, and crop comparison, preoperational period (May 1983 through December 1985) and 1991

Site	Analyte											
	Sodium			Calcium			Potassium			Magnesium		
	Deposition	Soil	Crop	Deposition	Soil	Crop	Deposition	Soil	Crop	Deposition	Soil	Crop
7	NC	D	F	D	NC	F	D	NC	F	NC	NC	F
11	NC	I	F	D	NC	F	D	I	F	D	I	F
12	NC	D	I	NC	D	I	NC	D	I	NC	D	NC
13	NC	NC	NC	NC	I	I	NC	I	I	NC	I	NC
23	I	NC	NA	I	D	NA	I	D	NA	I	D	NA
24	D	NC	F	D	NC	F	D	NC	F	D	NC	F
25	D	NC	F	D	I	F	D	NC	F	D	I	F
28	NC	NC	F	D	I	F	NC	NC	F	D	NC	F
30	NC	D	NC	NC	D	I	NC	I	I	NC	D	I
31	D	I	F	NC	I	F	D	NC	F	NC	NC	F
32	NC	D	F	NC	NC	F	NC	NC	F	NC	NC	F
43	NC	NC	NC	I	NC	I	D	NC	NC	NC	NC	NC
45	D	NC	F	NC	NC	F	D	NC	F	D	NC	F

Key: NC, no significant change from preoperational period; F, fallow, no sample; D, decrease; I, increase; NA, not applicable, current crop different from preoperational crop.

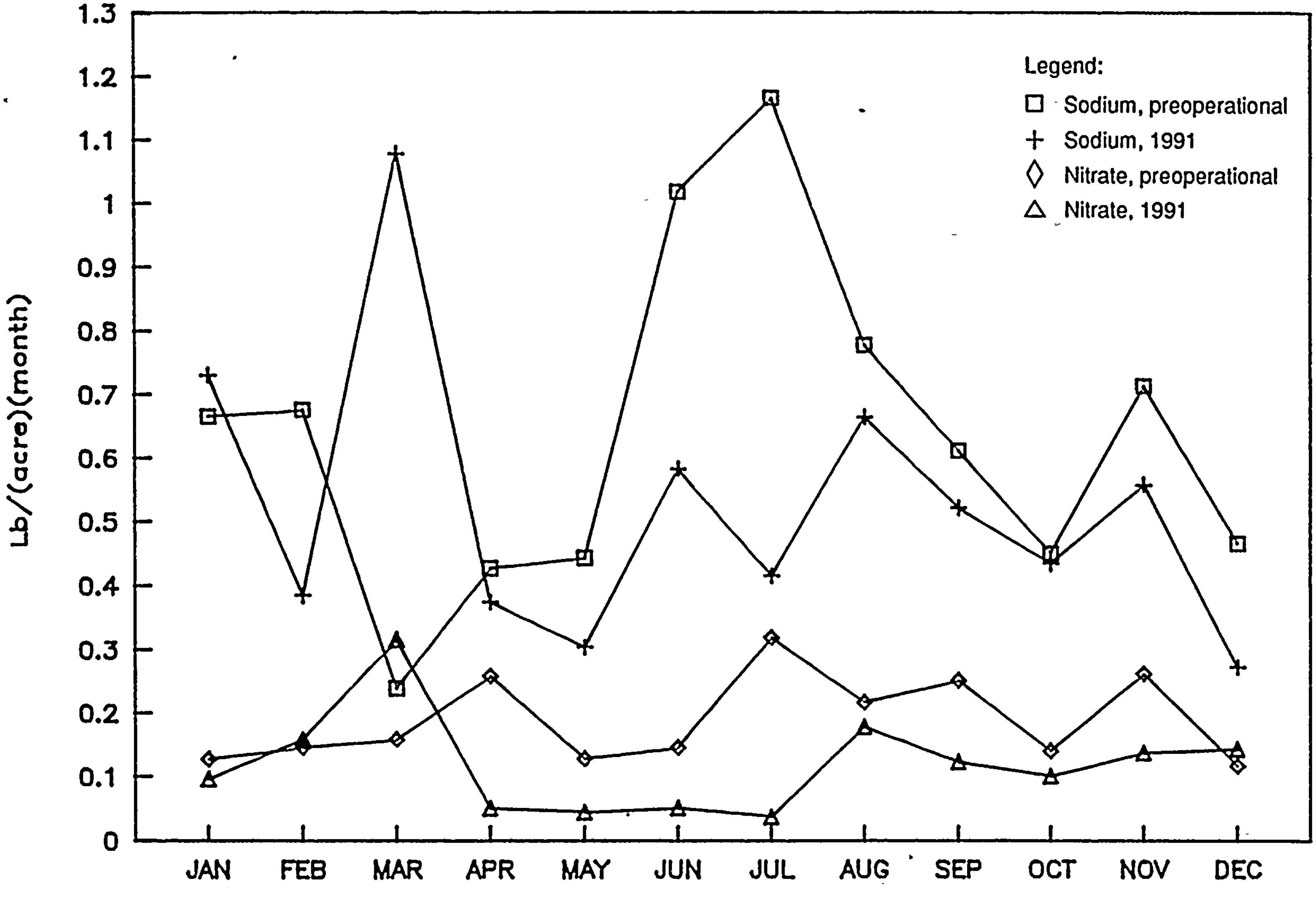

Figure 9-1. Mean monthly deposition of sodium and nitrate at PVNGS agricultural monitoring sites, preoperational period and 1991

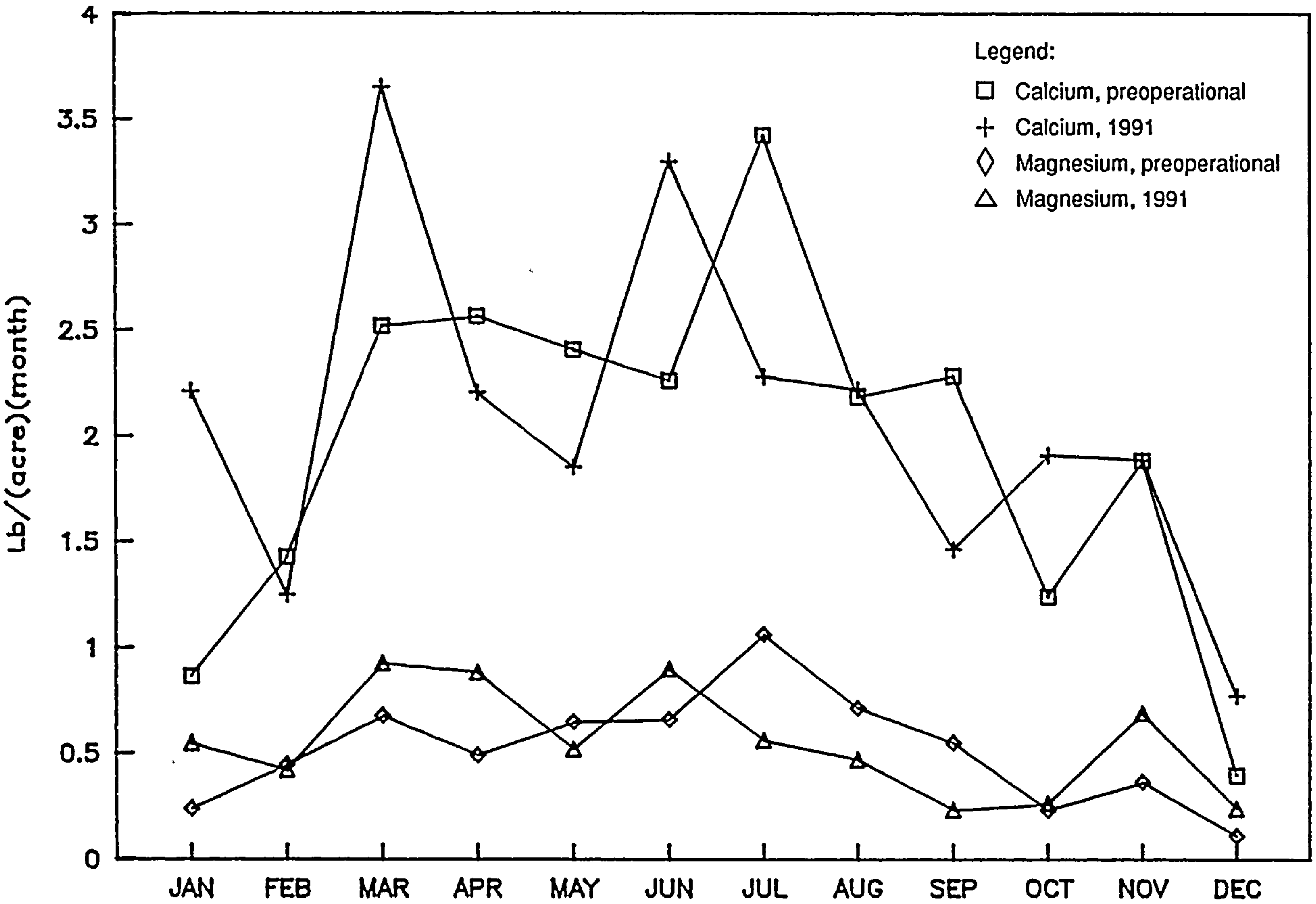

Figure 9-2. Mean monthly deposition of calcium and magnesium at PVNGS agricultural monitoring sites, preoperational period and 1991

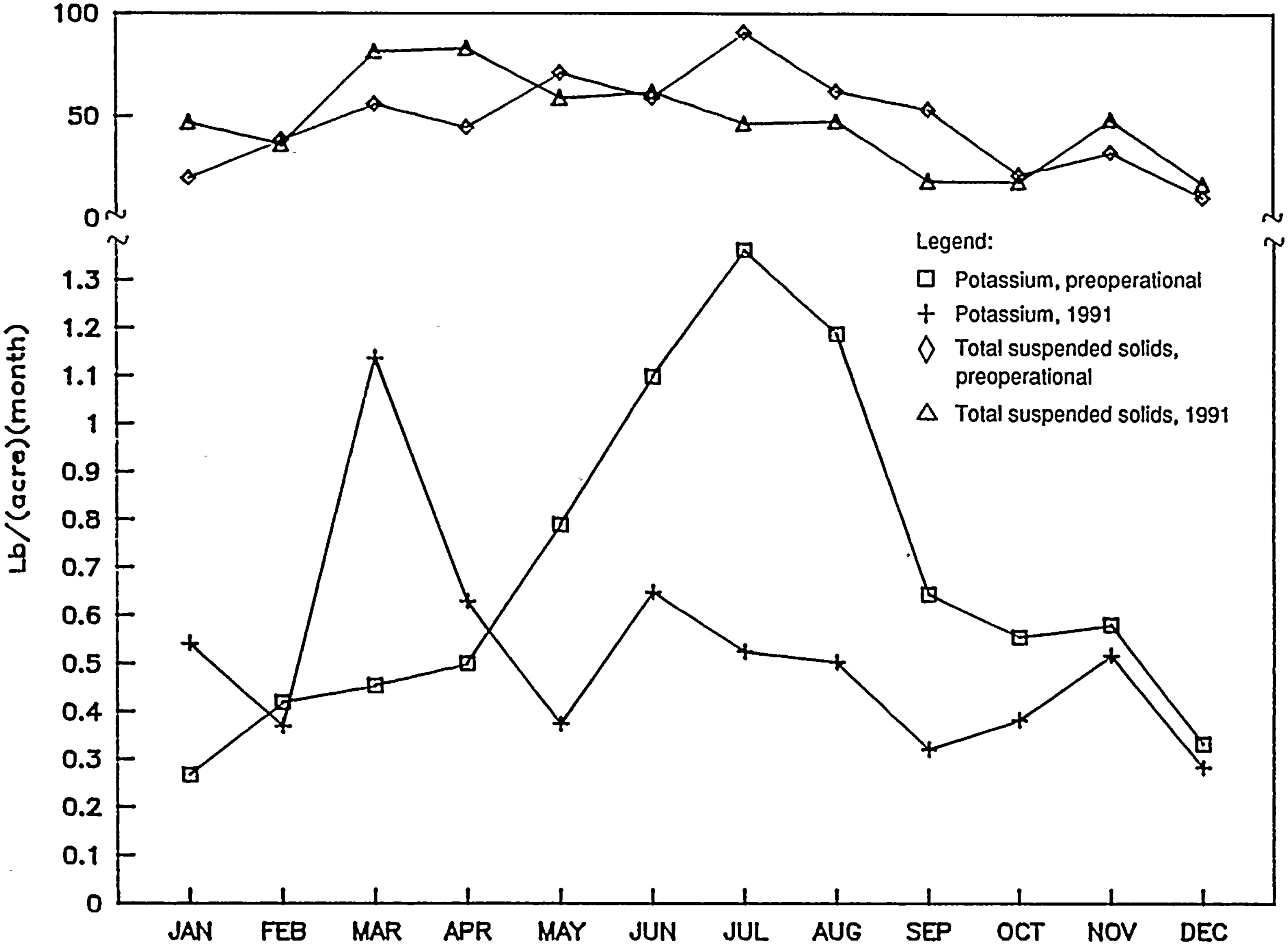

Figure 9-3. Mean monthly deposition of potassium and total suspended solids at PVNGS agricultural monitoring sites, preoperational period and 1991

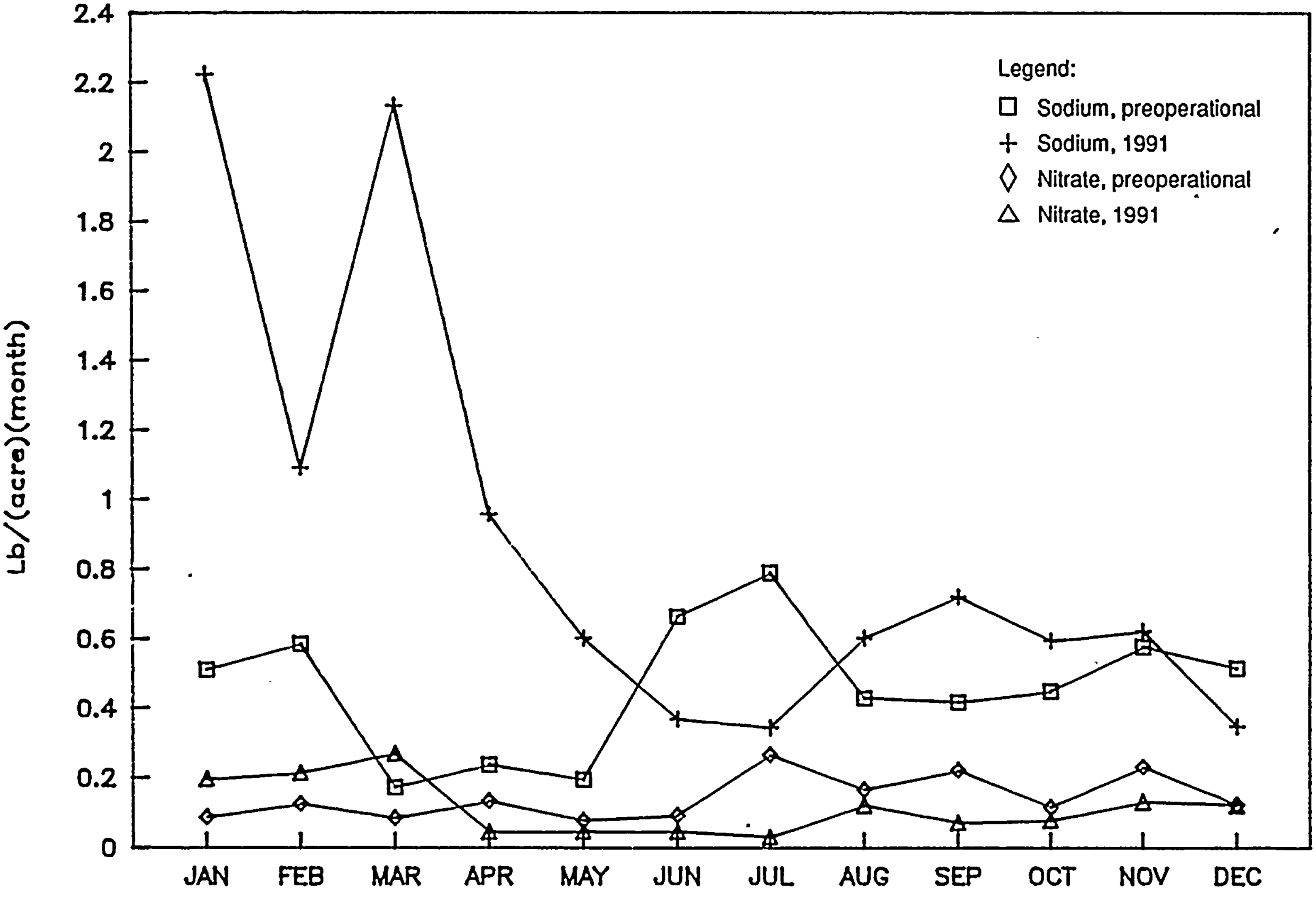

Figure 9-4. Mean monthly deposition of sodium and nitrate at PVNGS native monitoring sites (including sites 80 - 83), preoperational period and 1991

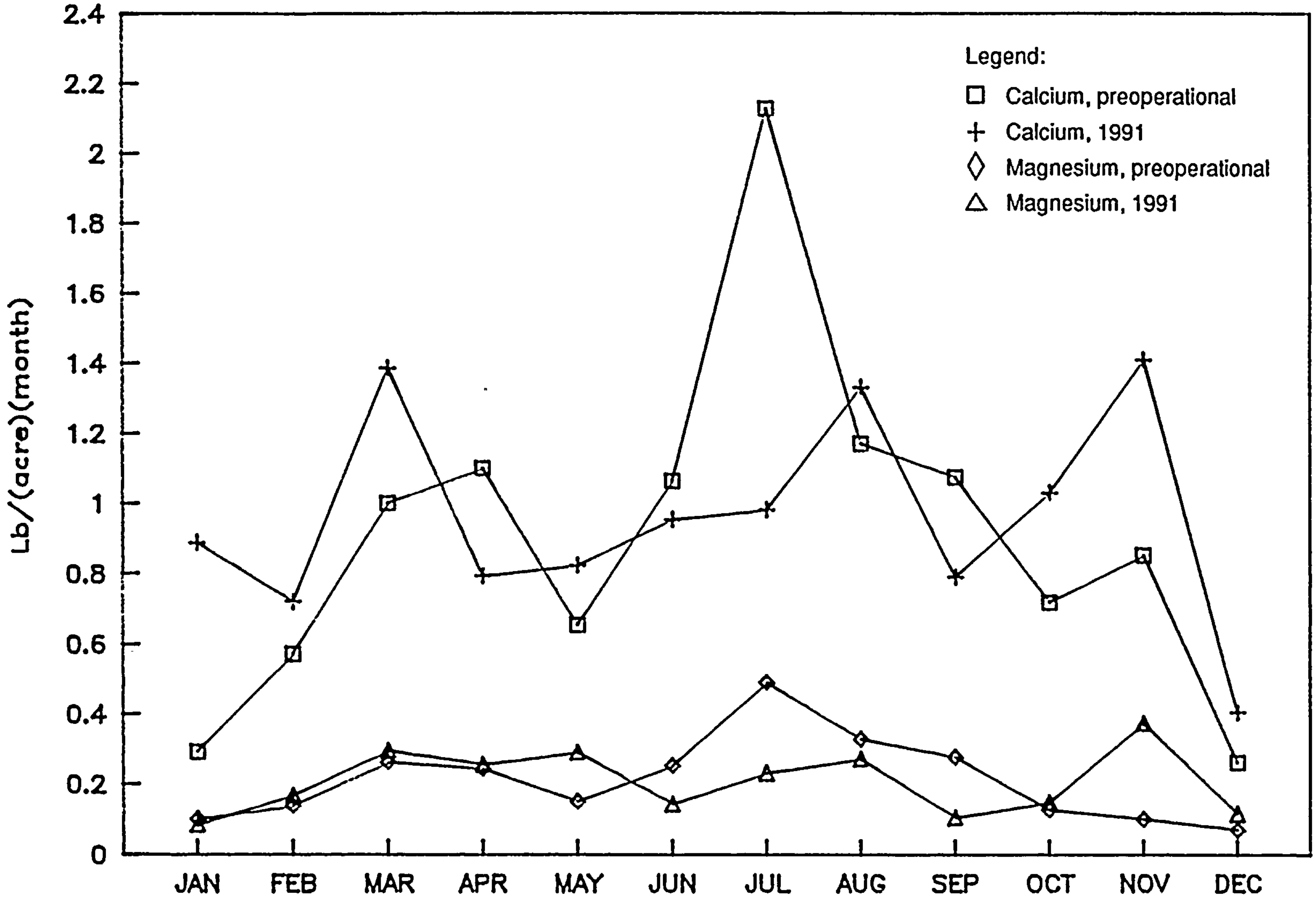

Figure 9-5. Mean monthly deposition of calcium and magnesium at PVNGS native monitoring sites (including sites 80 - 83), preoperational period and 1991

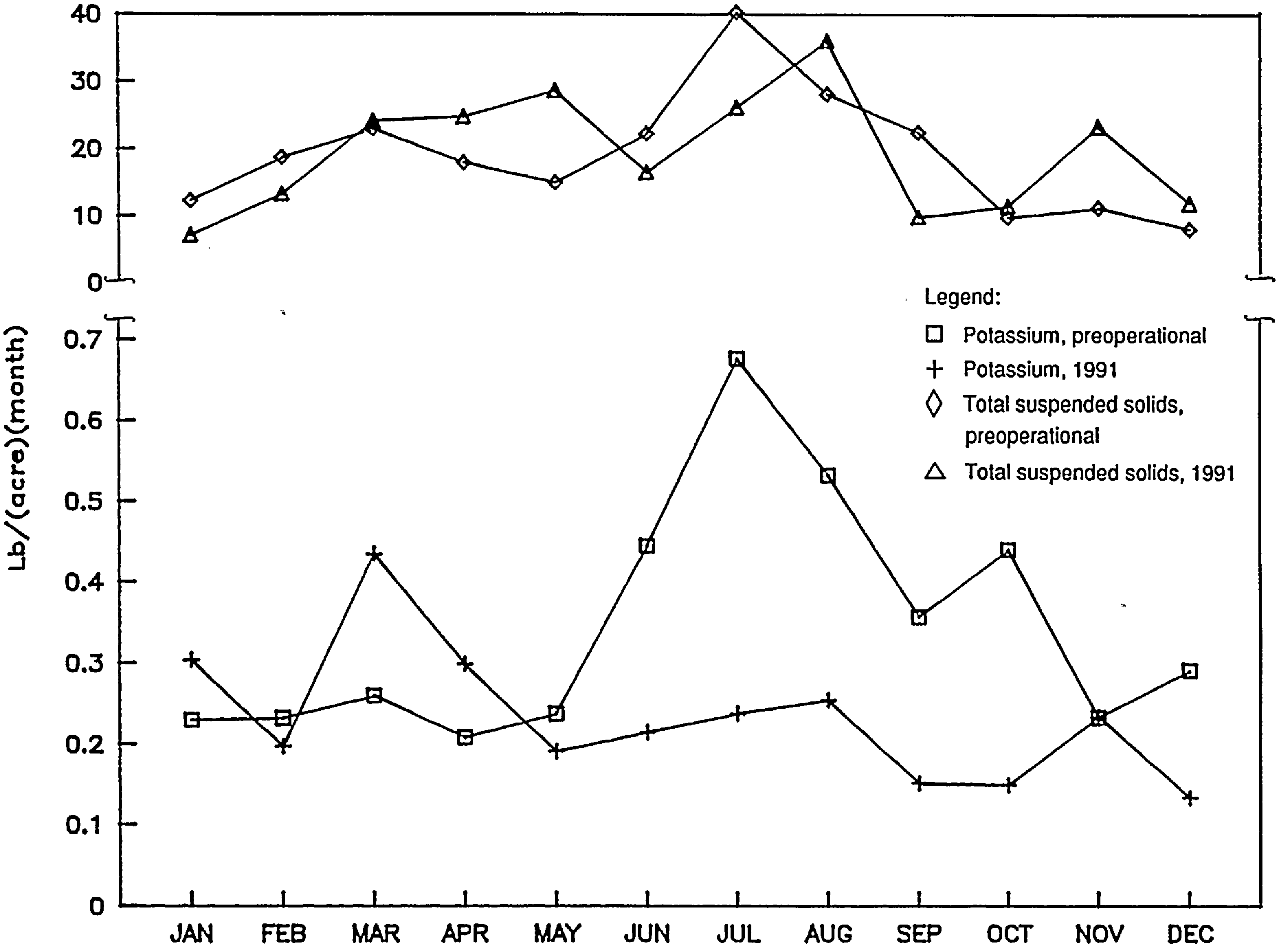

Figure 9-6. Mean monthly deposition of potassium and total suspended solids at PVNGS native monitoring sites (including sites 80 - 83), preoperational period and 1991

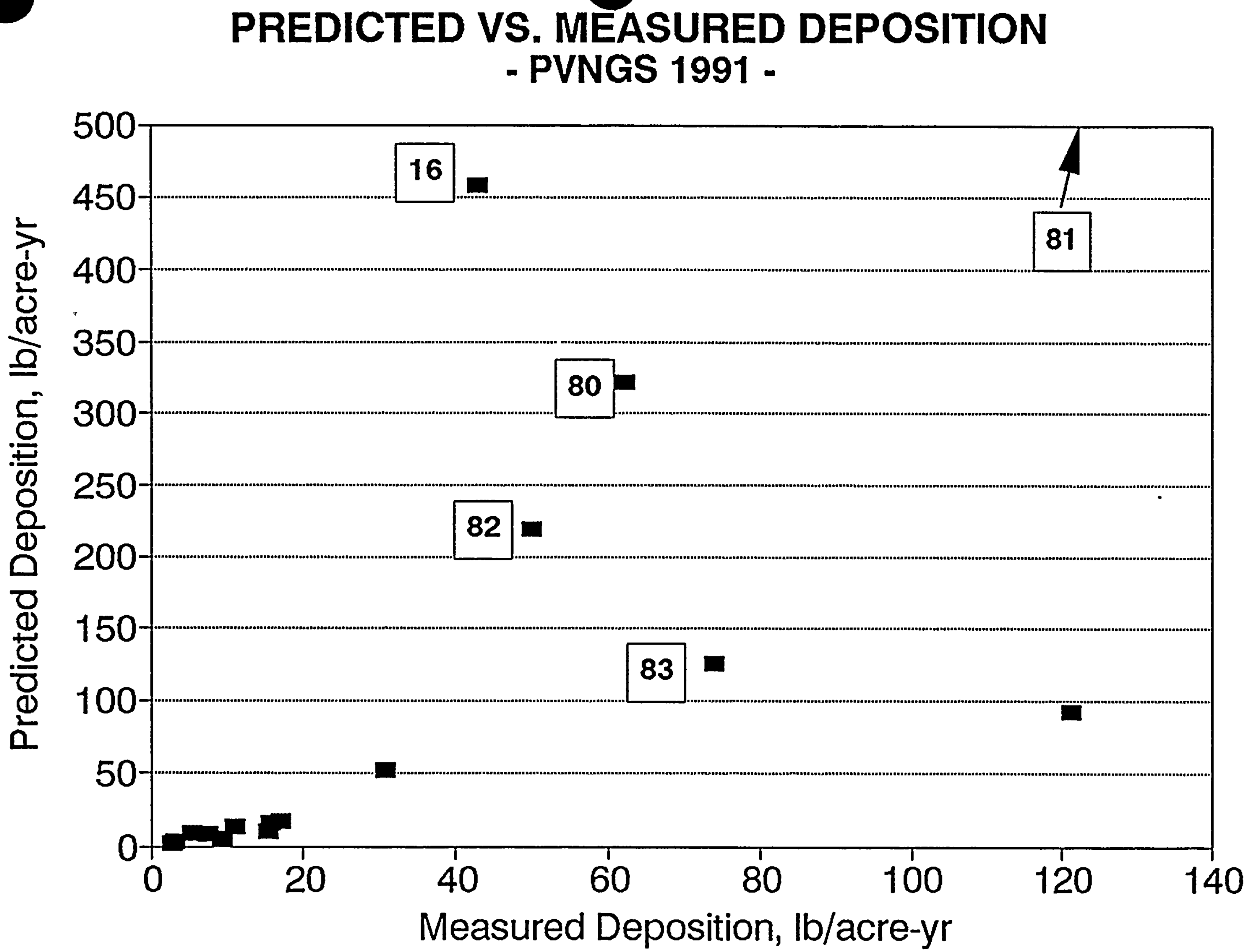

Figure 9-7. Predicted versus measured deposition for all onsite locations at PVNGS for 1991

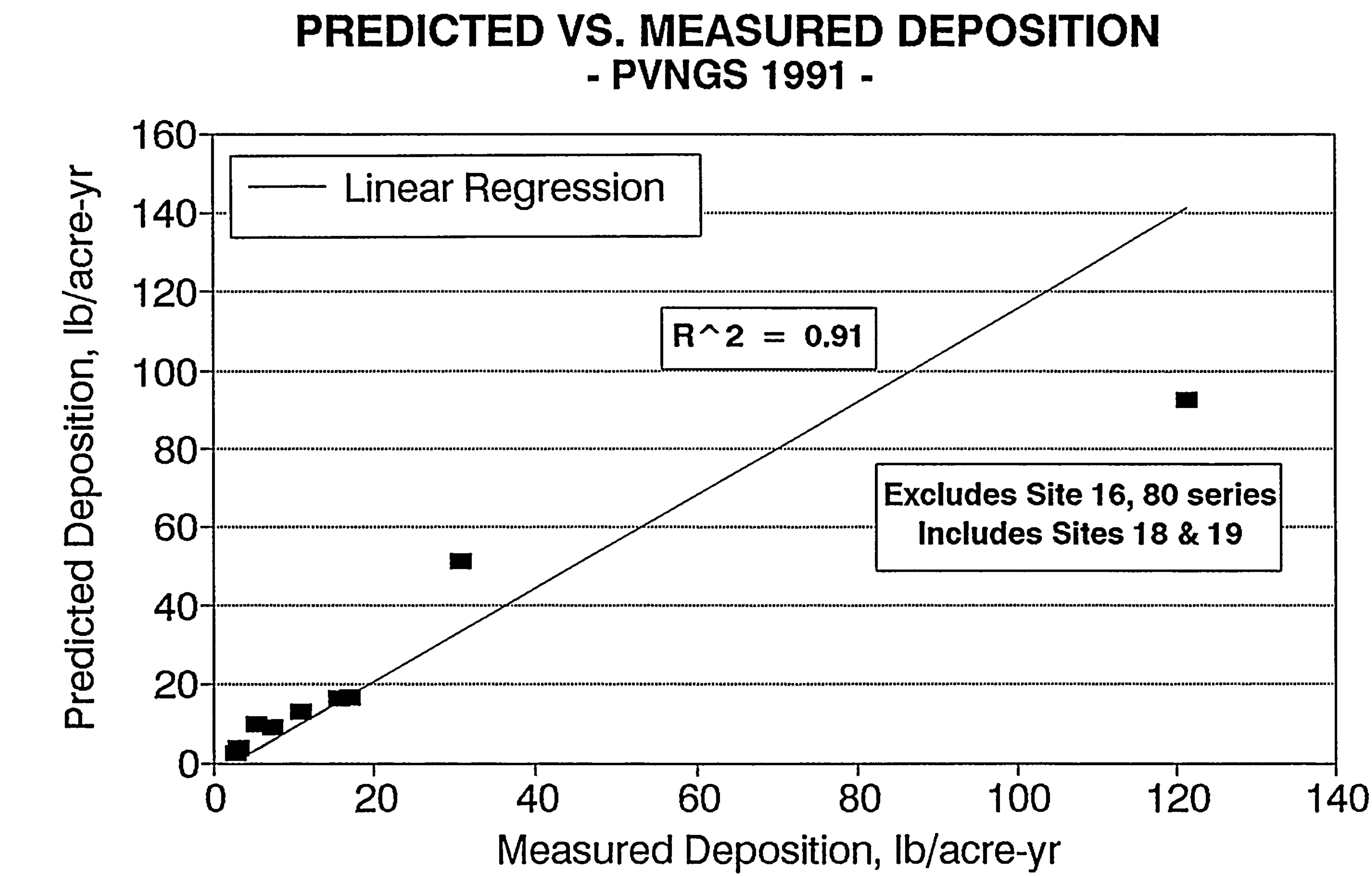

Figure 9-8. Predicted versus measured deposition for all onsite locations excluding sites 16, 80, 81, 82, and 83 and including near-site locations 18 and 19 at PVNGS for 1991

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APPENDIX A

PLANT OPERATING DATA

Appendix A

Plant Operating Data

Presented in this appendix are daily plant operating data which were used by the FOG code as input for the calculation of predicted drift deposition from the cooling towers for PVNGS Units 1-3. Specifically provided are circulating water conductivity data, circulating water thermal data, circulating water flowrate data (number of pumps operated per shift), total number of fans operated per shift for each of the three cooling towers, and calculated tower parameters.

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

JANUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	24900	91027	4	4	4	48	48	42
2	25700	90972	4	4	4	48	48	42
3	25900	90999	4	4	4	48	48	42
4	25700	90963	4	4	4	48	48	42
5	24600	90972	4	4	4	48	48	42
6	25200	91054	4	4	4	48	48	42
7	23000	90917	4	4	4	48	48	42
8	24700	90926	4	4	4	48	48	42
9	22700	90945	4	4	4	48	48	42
10	23900	90936	4	4	4	48	48	46
11	22500	83849	4	4	4	48	48	42
12	22700	2946	4	2	2	16	16	3
13	22100	0	2	0	0	0	0	0
14	21900	0	0	0	0	0	0	0
15	20600	0	0	0	0	0	0	0
16	20900	0	0	0	0	0	0	0
17	20300	0	0	0	0	0	0	0
18	20000	0	0	0	0	0	0	0
19	19700	0	0	0	0	0	0	0
20	19900	0	0	0	0	0	0	0
21	20500	0	0	0	0	0	0	0
22	20200	0	0	0	0	0	0	0
23	20400	0	0	0	0	0	0	0
24	19800	0	0	0	0	0	0	0
25	17700	0	0	0	0	0	0	0
26	18200	0	0	0	0	0	0	0
27	22500	0	0	0	0	0	0	0
28	19700	0	0	0	0	0	0	0
29	20000	0	0	0	0	0	0	0
30	19100	0	0	0	0	0	0	0
31	19200	0	0	0	0	0	0	0
AVERAGE	21748	32145	2	1	1	18	18	15

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JANUARY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10128	10128	8862	2.16E+08	20418	589,000	4.233	0.721
	2	10128	10128	8862	2.16E+08	21074	589,000	4.233	0.745
	3	10128	10128	8862	2.16E+08	21238	589,000	4.233	0.750
	4	10128	10128	8862	2.16E+08	21074	589,000	4.233	0.745
	5	10128	10128	8862	2.16E+08	20172	589,000	4.233	0.713
	6	10128	10128	8862	2.16E+08	20664	589,000	4.233	0.730
	7	10128	10128	8862	2.15E+08	18860	589,000	4.233	0.666
	8	10128	10128	8862	2.15E+08	20254	589,000	4.233	0.716
	9	10128	10128	8862	2.16E+08	18614	589,000	4.233	0.658
	10	10128	10128	9706	2.16E+08	19598	589,000	4.356	0.712
	11	10128	10128	8862	1.99E+08	18450	589,000	4.233	0.652
	12	3376	3376	633	6.98E+06	18614	402,333	0.733	0.114
	13	0	0	0	0.00E+00	18122	122,333	0.000	0.000
	14	0	0	0	0.00E+00	17958	29,000	0.000	0.000
	15	0	0	0	0.00E+00	16892	29,000	0.000	0.000
	16	0	0	0	0.00E+00	17138	29,000	0.000	0.000
	17	0	0	0	0.00E+00	16646	29,000	0.000	0.000
	18	0	0	0	0.00E+00	16400	29,000	0.000	0.000
	19	0	0	0	0.00E+00	16154	29,000	0.000	0.000
	20	0	0	0	0.00E+00	16318	29,000	0.000	0.000
	21	0	0	0	0.00E+00	16810	29,000	0.000	0.000
	22	0	0	0	0.00E+00	16564	29,000	0.000	0.000
	23	0	0	0	0.00E+00	16728	29,000	0.000	0.000
	24	0	0	0	0.00E+00	16236	29,000	0.000	0.000
	25	0	0	0	0.00E+00	14514	29,000	0.000	0.000
	26	0	0	0	0.00E+00	14924	29,000	0.000	0.000
	27	0	0	0	0.00E+00	18450	29,000	0.000	0.000
	28	0	0	0	0.00E+00	16154	29,000	0.000	0.000
	29	0	0	0	0.00E+00	16400	29,000	0.000	0.000
	30	0	0	0	0.00E+00	15662	29,000	0.000	0.000
	31	0	0	0	0.00E+00	15744	29,000	0.000	0.000
AVERAGE		3703	3703	3192	7.62E+07	17834	242,763	1.530	0.256

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	22900	0	0	0	0	0	0	0
2	13100	0	0	0	0	0	0	0
3	14600	0	0	0	0	0	0	0
4	14600	0	0	0	0	0	0	0
5	14500	0	0	0	0	0	0	0
6	13700	0	0	0	0	0	0	0
7	14400	0	0	0	0	0	0	0
8	14700	0	0	0	0	0	0	0
9	15000	0	0	0	0	0	0	0
10	13600	0	0	0	0	0	0	0
11	13400	0	0	0	0	0	0	0
12	13400	0	0	0	0	0	0	0
13	12700	0	0	0	0	0	0	0
14	12980	0	2	2	2	0	0	0
15	11860	0	2	2	2	0	0	0
16	10520	9248	2	2	3	8	0	0
17	10540	74209	4	4	4	45	32	32
18	13100	90945	4	4	4	45	48	48
19	14600	91009	4	4	4	46	48	45
20	15900	90963	4	4	4	47	48	45
21	17400	90853	4	4	4	48	48	45
22	18400	90990	4	4	4	48	48	46
23	20700	91027	4	4	4	48	48	48
24	20500	90553	4	4	4	48	48	48
25	21200	91018	4	4	4	48	48	48
26	22300	91054	4	4	4	48	48	48
27	23500	91091	4	4	4	48	48	48
28	26700	91045	4	4	4	48	48	48
AVERAGE	16100	38714	2	2	2	21	20	20

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
FEBRUARY DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	0	0	0	0.00E+00	19465	29,000	0.000	0.000
2	0	0	0	0.00E+00	11135	29,000	0.000	0.000
3	0	0	0	0.00E+00	12410	29,000	0.000	0.000
4	0	0	0	0.00E+00	12410	29,000	0.000	0.000
5	0	0	0	0.00E+00	12325	29,000	0.000	0.000
6	0	0	0	0.00E+00	11645	29,000	0.000	0.000
7	0	0	0	0.00E+00	12240	29,000	0.000	0.000
8	0	0	0	0.00E+00	12495	29,000	0.000	0.000
9	0	0	0	0.00E+00	12750	29,000	0.000	0.000
10	0	0	0	0.00E+00	11560	29,000	0.000	0.000
11	0	0	0	0.00E+00	11390	29,000	0.000	0.000
12	0	0	0	0.00E+00	11390	29,000	0.000	0.000
13	0	0	0	0.00E+00	10795	29,000	0.000	0.000
14	0	0	0	0.00E+00	11033	309,000	0.000	0.000
15	0	0	0	0.00E+00	10081	309,000	0.000	0.000
16	1688	0	0	2.19E+07	8942	355,667	0.148	0.011
17	9495	6752	6752	1.76E+08	8959	589,000	3.344	0.250
18	9495	10128	10128	2.16E+08	11135	589,000	4.325	0.402
19	9706	10128	9495	2.16E+08	12410	589,000	4.264	0.442
20	9917	10128	9495	2.16E+08	13515	589,000	4.295	0.484
21	10128	10128	9495	2.15E+08	14790	589,000	4.325	0.534
22	10128	10128	9706	2.16E+08	15640	589,000	4.356	0.569
23	10128	10128	10128	2.16E+08	17595	589,000	4.418	0.649
24	10128	10128	10128	2.15E+08	17425	589,000	4.418	0.642
25	10128	10128	10128	2.16E+08	18020	589,000	4.418	0.664
26	10128	10128	10128	2.16E+08	18955	589,000	4.418	0.699
27	10128	10128	10128	2.16E+08	19975	589,000	4.418	0.736
28	10128	10128	10128	2.16E+08	22695	589,000	4.418	0.837
AVERAGE	4333	4220	4137	9.18E+07	13685	300,667	1.842	0.247

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	26500	90926	4	4	4	48	48	48
	2	25300	90981	4	4	4	48	48	48
	3	27800	91045	4	4	4	48	48	48
	4	27500	91045	4	4	4	48	48	48
	5	32300	91054	4	4	4	48	48	48
	6	31000	91045	4	4	4	48	48	48
	7	29900	91081	4	4	4	48	45	48
	8	31100	91072	4	4	4	48	46	48
	9	30100	91100	4	4	4	48	48	48
	10	32600	91081	4	4	4	48	48	48
	11	33600	91054	4	4	4	48	48	48
	12	30000	91054	4	4	4	48	48	48
	13	30400	91027	4	4	4	48	48	48
	14	30200	91033	4	4	4	48	48	48
	15	28000	91100	4	4	4	48	48	48
	16	24700	91054	4	4	4	48	48	48
	17	29100	91027	4	4	4	48	48	48
	18	27900	91063	4	4	4	48	46	48
	19	30300	91091	4	4	4	48	45	48
	20	27900	90999	4	4	4	48	44	48
	21	28200	91045	4	4	4	48	45	48
	22	28200	91072	4	4	4	48	45	48
	23	28200	91118	4	4	4	48	45	48
	24	25200	91118	4	4	4	48	45	48
	25	26900	90990	4	4	4	48	45	48
	26	27600	91072	4	4	4	48	45	48
	27	27400	91009	4	4	4	48	46	48
	28	25900	91100	4	4	4	48	48	47
	29	27000	91100	4	4	4	48	48	48
	30	28600	91091	4	4	4	48	48	48
	31	28300	91072	4	4	4	48	48	48
AVERAGE		28635	91055	4	4	4	48	47	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.84 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MARCH	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10128	10128	10128	2.15E+08	22260	589,000	4.418	0.821
	2	10128	10128	10128	2.16E+08	21252	589,000	4.418	0.783
	3	10128	10128	10128	2.16E+08	23352	589,000	4.418	0.861
	4	10128	10128	10128	2.16E+08	23100	589,000	4.418	0.852
	5	10128	10128	10128	2.16E+08	27132	589,000	4.418	1.000
	6	10128	10128	10128	2.16E+08	26040	589,000	4.418	0.960
	7	10128	9495	10128	2.16E+08	25116	589,000	4.325	0.907
	8	10128	9706	10128	2.16E+08	26124	589,000	4.356	0.950
	9	10128	10128	10128	2.16E+08	25284	589,000	4.418	0.932
	10	10128	10128	10128	2.16E+08	27384	589,000	4.418	1.009
	11	10128	10128	10128	2.16E+08	28224	589,000	4.418	1.040
	12	10128	10128	10128	2.16E+08	25200	589,000	4.418	0.929
	13	10128	10128	10128	2.16E+08	25536	589,000	4.418	0.941
	14	10128	10128	10128	2.16E+08	25368	589,000	4.418	0.935
	15	10128	10128	10128	2.16E+08	23520	589,000	4.418	0.867
	16	10128	10128	10128	2.16E+08	20748	589,000	4.418	0.765
	17	10128	10128	10128	2.16E+08	24444	589,000	4.418	0.901
	18	10128	9706	10128	2.16E+08	23436	589,000	4.356	0.852
	19	10128	9495	10128	2.16E+08	25452	589,000	4.325	0.919
	20	10128	9284	10128	2.16E+08	23436	589,000	4.295	0.840
	21	10128	9495	10128	2.16E+08	23688	589,000	4.325	0.855
	22	10128	9495	10128	2.16E+08	23688	589,000	4.325	0.855
	23	10128	9495	10128	2.16E+08	23688	589,000	4.325	0.855
	24	10128	9495	10128	2.16E+08	21168	589,000	4.325	0.764
	25	10128	9495	10128	2.16E+08	22596	589,000	4.325	0.816
	26	10128	9495	10128	2.16E+08	23184	589,000	4.325	0.837
	27	10128	9706	10128	2.16E+08	23016	589,000	4.356	0.837
	28	10128	10128	9917	2.16E+08	21756	589,000	4.387	0.796
	29	10128	10128	10128	2.16E+08	22680	589,000	4.418	0.836
	30	10128	10128	10128	2.16E+08	24024	589,000	4.418	0.886
	31	10128	10128	10128	2.16E+08	23772	589,000	4.418	0.876
AVERAGE		10128	9897	10121	2.16E+08	24054	589,000	4.383	0.880

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.84 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	29300	91136	4	4	4	48	48	48
	2	28800	91118	4	4	4	48	45	48
	3	29300	91136	4	4	4	48	45	48
	4	30600	91109	4	4	4	48	46	48
	5	31300	91027	4	4	4	48	48	48
	6	31100	91018	4	4	4	48	48	48
	7	30700	91081	4	4	4	48	48	48
	8	30800	91081	4	4	4	48	48	48
	9	30900	91100	4	4	4	48	48	48
	10	28800	91063	4	4	4	48	48	48
	11	28100	91081	4	4	4	48	48	48
	12	26600	91109	4	4	4	48	48	48
	13	27500	91100	4	4	4	48	48	48
	14	27200	91109	4	4	4	48	48	48
	15	27900	91081	4	4	4	48	48	48
	16	29300	91109	4	4	4	48	48	48
	17	28600	91109	4	4	4	48	48	48
	18	28500	91081	4	4	4	48	48	48
	19	29300	91118	4	4	4	48	48	48
	20	28100	91136	4	4	4	48	48	48
	21	29100	91118	4	4	4	48	48	48
	22	28400	91136	4	4	4	48	48	48
	23	28700	91127	4	4	4	48	48	48
	24	27800	91109	4	4	4	48	48	48
	25	27400	91036	4	4	4	48	48	48
	26	26400	90726	4	4	4	48	48	48
	27	25800	90224	4	4	4	48	48	48
	28	26100	91109	4	4	4	48	48	48
	29	26500	91164	4	4	4	48	48	48
	30	26700	91109	4	4	4	48	48	48
AVERAGE		28520	91059	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.84 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

APRIL	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10128	10128	10128	2.16E+08	24612	589,000	4.418	0.907
	2	10128	9495	10128	2.16E+08	24192	589,000	4.325	0.873
	3	10128	9495	10128	2.16E+08	24612	589,000	4.325	0.888
	4	10128	9706	10128	2.16E+08	25704	589,000	4.356	0.934
	5	10128	10128	10128	2.16E+08	26292	589,000	4.418	0.969
	6	10128	10128	10128	2.16E+08	26124	589,000	4.418	0.963
	7	10128	10128	10128	2.16E+08	25788	589,000	4.418	0.951
	8	10128	10128	10128	2.16E+08	25872	589,000	4.418	0.954
	9	10128	10128	10128	2.16E+08	25956	589,000	4.418	0.957
	10	10128	10128	10128	2.16E+08	24192	589,000	4.418	0.892
	11	10128	10128	10128	2.16E+08	23604	589,000	4.418	0.870
	12	10128	10128	10128	2.16E+08	22344	589,000	4.418	0.824
	13	10128	10128	10128	2.16E+08	23100	589,000	4.418	0.852
	14	10128	10128	10128	2.16E+08	22848	589,000	4.418	0.842
	15	10128	10128	10128	2.16E+08	23436	589,000	4.418	0.864
	16	10128	10128	10128	2.16E+08	24612	589,000	4.418	0.907
	17	10128	10128	10128	2.16E+08	24024	589,000	4.418	0.886
	18	10128	10128	10128	2.16E+08	23940	589,000	4.418	0.883
	19	10128	10128	10128	2.16E+08	24612	589,000	4.418	0.907
	20	10128	10128	10128	2.16E+08	23604	589,000	4.418	0.870
	21	10128	10128	10128	2.16E+08	24444	589,000	4.418	0.901
	22	10128	10128	10128	2.16E+08	23856	589,000	4.418	0.879
	23	10128	10128	10128	2.16E+08	24108	589,000	4.418	0.889
	24	10128	10128	10128	2.16E+08	23352	589,000	4.418	0.861
	25	10128	10128	10128	2.16E+08	23016	589,000	4.418	0.848
	26	10128	10128	10128	2.15E+08	22176	589,000	4.418	0.817
	27	10128	10128	10128	2.14E+08	21672	589,000	4.418	0.799
	28	10128	10128	10128	2.16E+08	21924	589,000	4.418	0.808
	29	10128	10128	10128	2.16E+08	22260	589,000	4.418	0.821
	30	10128	10128	10128	2.16E+08	22428	589,000	4.418	0.827
AVERAGE		10128	10072	10128	2.16E+08	23957	589,000	4.409	0.881

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.84 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	27600	91136	4	4	4	48	48	48
	2	27900	91145	4	4	4	48	48	48
	3	27500	91145	4	4	4	48	48	48
	4	26700	91136	4	4	4	48	48	48
	5	27400	91154	4	4	4	48	48	48
	6	27900	91109	4	4	4	48	48	48
	7	27900	91118	4	4	4	48	48	48
	8	27700	91118	4	4	4	48	48	48
	9	26100	91127	4	4	4	48	48	48
	10	23900	91109	4	4	4	48	48	48
	11	23300	91109	4	4	4	48	48	48
	12	23400	91136	4	4	4	48	48	48
	13	23600	91164	4	4	4	48	48	48
	14	24600	91154	4	4	4	46	48	48
	15	24300	91127	4	4	4	48	48	48
	16	24600	91145	4	4	4	48	48	48
	17	27000	91136	4	4	4	48	48	48
	18	26300	91145	4	4	4	48	48	48
	19	24900	91100	4	4	4	48	48	48
	20	26600	91054	4	4	4	48	48	48
	21	27200	91127	4	4	4	48	48	48
	22	27700	91136	4	4	4	48	48	48
	23	27900	91136	4	4	4	48	48	48
	24	28400	90917	4	4	4	48	48	48
	25	28600	90498	4	4	4	48	48	48
	26	30600	91154	4	4	4	48	48	48
	27	30400	91182	4	4	4	48	48	48
	28	30500	91127	4	4	4	48	48	48
	29	30400	91118	4	4	4	48	48	48
	30	30200	91136	4	4	4	48	48	48
	31	30400	91127	4	4	4	48	48	48
AVERAGE		27145	91104	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

MAY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10128	10128	10128	2.16E+08	22632	589,000	4.418	0.834
	2	10128	10128	10128	2.16E+08	22878	589,000	4.418	0.843
	3	10128	10128	10128	2.16E+08	22550	589,000	4.418	0.831
	4	10128	10128	10128	2.16E+08	21894	589,000	4.418	0.807
	5	10128	10128	10128	2.16E+08	22468	589,000	4.418	0.828
	6	10128	10128	10128	2.16E+08	22878	589,000	4.418	0.843
	7	10128	10128	10128	2.16E+08	22878	589,000	4.418	0.843
	8	10128	10128	10128	2.16E+08	22714	589,000	4.418	0.837
	9	10128	10128	10128	2.16E+08	21402	589,000	4.418	0.789
	10	10128	10128	10128	2.16E+08	19598	589,000	4.418	0.722
	11	10128	10128	10128	2.16E+08	19106	589,000	4.418	0.704
	12	10128	10128	10128	2.16E+08	19188	589,000	4.418	0.707
	13	10128	10128	10128	2.16E+08	19352	589,000	4.418	0.713
	14	9706	10128	10128	2.16E+08	20172	589,000	4.356	0.733
	15	10128	10128	10128	2.16E+08	19926	589,000	4.418	0.735
	16	10128	10128	10128	2.16E+08	20172	589,000	4.418	0.744
	17	10128	10128	10128	2.16E+08	22140	589,000	4.418	0.816
	18	10128	10128	10128	2.16E+08	21566	589,000	4.418	0.795
	19	10128	10128	10128	2.16E+08	20418	589,000	4.418	0.753
	20	10128	10128	10128	2.16E+08	21812	589,000	4.418	0.804
	21	10128	10128	10128	2.16E+08	22304	589,000	4.418	0.822
	22	10128	10128	10128	2.16E+08	22714	589,000	4.418	0.837
	23	10128	10128	10128	2.16E+08	22878	589,000	4.418	0.843
	24	10128	10128	10128	2.15E+08	23288	589,000	4.418	0.858
	25	10128	10128	10128	2.14E+08	23452	589,000	4.418	0.865
	26	10128	10128	10128	2.16E+08	25092	589,000	4.418	0.925
	27	10128	10128	10128	2.16E+08	24928	589,000	4.418	0.919
	28	10128	10128	10128	2.16E+08	25010	589,000	4.418	0.922
	29	10128	10128	10128	2.16E+08	24928	589,000	4.418	0.919
	30	10128	10128	10128	2.16E+08	24764	589,000	4.418	0.913
	31	10128	10128	10128	2.16E+08	24928	589,000	4.418	0.919
AVERAGE		10114	10128	10128	2.16E+08	22259	589,000	4.416	0.820

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	30500	91081	4	4	4	48	48	48
	2	29800	91136	4	4	4	48	48	48
	3	29200	91136	4	4	4	48	48	48
	4	28900	91136	4	4	4	48	48	48
	5	29400	91173	4	4	4	46	48	48
	6	28900	91136	4	4	4	46	48	48
	7	28800	91118	4	4	4	48	48	48
	8	28800	91154	4	4	4	48	48	48
	9	28900	91154	4	4	4	48	48	48
	10	28400	91136	4	4	4	46	48	48
	11	29300	91154	4	4	4	45	48	48
	12	29100	91145	4	4	4	46	48	48
	13	27900	91173	4	4	4	48	46	47
	14	29200	91145	4	4	4	48	45	48
	15	28600	91154	4	4	4	48	45	48
	16	29100	91154	4	4	4	48	45	48
	17	29100	91164	4	4	4	48	45	48
	18	29200	91164	4	4	4	48	45	48
	19	29400	91154	4	4	4	48	45	48
	20	29300	91164	4	4	4	48	45	48
	21	28000	91145	4	4	4	48	45	48
	22	27800	91164	4	4	4	48	45	48
	23	26800	91182	4	4	4	48	45	48
	24	27500	91164	4	4	4	48	45	47
	25	27500	91127	4	4	4	48	45	48
	26	27300	82071	4	4	4	48	26	48
	27	28000	91136	4	4	4	48	48	48
	28	27800	91145	4	4	4	48	48	48
	29	28600	91182	4	4	4	48	48	48
	30	28400	91145	4	4	4	48	48	48
AVERAGE		28650	90846	4	4	4	48	46	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JUNE	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10128	10128	10128	2.16E+08	22875	589,000	4.418	0.843
	2	10128	10128	10128	2.16E+08	22350	589,000	4.418	0.824
	3	10128	10128	10128	2.16E+08	21900	589,000	4.418	0.807
	4	10128	10128	10128	2.16E+08	21675	589,000	4.418	0.799
	5	9706	10128	10128	2.16E+08	22050	589,000	4.356	0.802
	6	9706	10128	10128	2.16E+08	21675	589,000	4.356	0.788
	7	10128	10128	10128	2.16E+08	21600	589,000	4.418	0.796
	8	10128	10128	10128	2.16E+08	21600	589,000	4.418	0.796
	9	10128	10128	10128	2.16E+08	21675	589,000	4.418	0.799
	10	9706	10128	10128	2.16E+08	21300	589,000	4.356	0.774
	11	9495	10128	10128	2.16E+08	21975	589,000	4.325	0.793
	12	9706	10128	10128	2.16E+08	21825	589,000	4.356	0.793
	13	10128	9706	9917	2.16E+08	20925	589,000	4.325	0.755
	14	10128	9495	10128	2.16E+08	21900	589,000	4.325	0.791
	15	10128	9495	10128	2.16E+08	21450	589,000	4.325	0.774
	16	10128	9495	10128	2.16E+08	21825	589,000	4.325	0.788
	17	10128	9495	10128	2.16E+08	21825	589,000	4.325	0.788
	18	10128	9495	10128	2.16E+08	21900	589,000	4.325	0.791
	19	10128	9495	10128	2.16E+08	22050	589,000	4.325	0.796
	20	10128	9495	10128	2.16E+08	21975	589,000	4.325	0.793
	21	10128	9495	10128	2.16E+08	21000	589,000	4.325	0.758
	22	10128	9495	10128	2.16E+08	20850	589,000	4.325	0.753
	23	10128	9495	10128	2.16E+08	20100	589,000	4.325	0.726
	24	10128	9495	9917	2.16E+08	20625	589,000	4.295	0.739
	25	10128	9495	10128	2.16E+08	20625	589,000	4.325	0.744
	26	10128	5486	10128	1.95E+08	20475	589,000	3.743	0.639
	27	10128	10128	10128	2.16E+08	21000	589,000	4.418	0.774
	28	10128	10128	10128	2.16E+08	20850	589,000	4.418	0.769
	29	10128	10128	10128	2.16E+08	21450	589,000	4.418	0.791
	30	10128	10128	10128	2.16E+08	21300	589,000	4.418	0.785
AVERAGE		10051	9706	10114	2.15E+08	21488	589,000	4.343	0.779

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.75 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	28,600	91,173	4	4	4	48	48	48
	2	29,100	91,145	3	4	4	48	48	45
	3	30,200	91,164	4	4	4	48	48	46
	4	32,000	91,154	4	4	4	48	48	48
	5	31,300	91,054	4	4	4	48	48	48
	6	30,500	91,136	4	4	4	48	48	48
	7	31,000	91,164	4	4	4	48	48	48
	8	27,800	91,164	4	4	4	48	48	48
	9	27,400	91,154	4	4	4	48	48	48
	10	28,000	91,154	4	4	4	48	48	48
	11	28,000	91,173	4	4	4	48	48	48
	12	28,200	91,164	4	4	4	48	48	48
	13	29,100	91,173	4	4	4	48	48	48
	14	29,000	91,164	4	4	4	48	48	48
	15	28,900	91,164	4	4	4	48	48	48
	16	29,700	91,145	4	4	4	48	48	48
	17	30,800	91,164	4	4	4	48	48	48
	18	30,900	91,182	4	4	4	48	48	48
	19	30,900	91,164	4	4	4	48	48	48
	20	31,400	91,145	4	4	4	48	48	48
	21	31,600	91,173	4	4	4	48	48	48
	22	32,400	91,173	4	4	4	48	48	48
	23	31,600	91,173	4	4	4	48	48	48
	24	33,800	91,164	4	4	4	48	48	48
	25	31,200	91,164	4	4	4	48	48	48
	26	34,500	91,164	4	4	4	48	48	48
	27	35,800	91,182	4	4	4	48	48	48
	28	35,800	91,154	4	4	4	48	48	48
	29	37,500	91,145	4	4	4	45	48	48
	30	38,100	91,145	4	4	4	45	48	48
	31	38,200	91,136	4	4	4	45	48	48
AVERAGE		31,397	91,157	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.71 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JULY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	20,306	589,000	4.418	0.749
	2	10,128	10,128	9,495	2.16E+08	20,661	542,333	3.983	0.687
	3	10,128	10,128	9,706	2.16E+08	21,442	589,000	4.356	0.779
	4	10,128	10,128	10,128	2.16E+08	22,720	589,000	4.418	0.838
	5	10,128	10,128	10,128	2.16E+08	22,223	589,000	4.418	0.819
	6	10,128	10,128	10,128	2.16E+08	21,655	589,000	4.418	0.798
	7	10,128	10,128	10,128	2.16E+08	22,010	589,000	4.418	0.811
	8	10,128	10,128	10,128	2.16E+08	19,738	589,000	4.418	0.728
	9	10,128	10,128	10,128	2.16E+08	19,454	589,000	4.418	0.717
	10	10,128	10,128	10,128	2.16E+08	19,880	589,000	4.418	0.733
	11	10,128	10,128	10,128	2.16E+08	19,880	589,000	4.418	0.733
	12	10,128	10,128	10,128	2.16E+08	20,022	589,000	4.418	0.738
	13	10,128	10,128	10,128	2.16E+08	20,661	589,000	4.418	0.762
	14	10,128	10,128	10,128	2.16E+08	20,590	589,000	4.418	0.759
	15	10,128	10,128	10,128	2.16E+08	20,519	589,000	4.418	0.756
	16	10,128	10,128	10,128	2.16E+08	21,087	589,000	4.418	0.777
	17	10,128	10,128	10,128	2.16E+08	21,868	589,000	4.418	0.806
	18	10,128	10,128	10,128	2.16E+08	21,939	589,000	4.418	0.809
	19	10,128	10,128	10,128	2.16E+08	21,939	589,000	4.418	0.809
	20	10,128	10,128	10,128	2.16E+08	22,294	589,000	4.418	0.822
	21	10,128	10,128	10,128	2.16E+08	22,436	589,000	4.418	0.827
	22	10,128	10,128	10,128	2.16E+08	23,004	589,000	4.418	0.848
	23	10,128	10,128	10,128	2.16E+08	22,436	589,000	4.418	0.827
	24	10,128	10,128	10,128	2.16E+08	23,998	589,000	4.418	0.885
	25	10,128	10,128	10,128	2.16E+08	22,152	589,000	4.418	0.817
	26	10,128	10,128	10,128	2.16E+08	24,495	589,000	4.418	0.903
	27	10,128	10,128	10,128	2.16E+08	25,418	589,000	4.418	0.937
	28	10,128	10,128	10,128	2.16E+08	25,418	589,000	4.418	0.937
	29	9,495	10,128	10,128	2.16E+08	26,625	589,000	4.325	0.961
	30	9,495	10,128	10,128	2.16E+08	27,051	589,000	4.325	0.976
	31	9,495	10,128	10,128	2.16E+08	27,122	589,000	4.325	0.979
AVERAGE		10,067	10,128	10,094	2.16E+08	22,292	587,495	4.393	0.817

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.71 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	37,300	91,136	4	4	4	45	48	48
	2	38,700	91,173	4	4	4	42	48	48
	3	39,500	91,136	4	4	4	44	48	48
	4	38,900	91,154	4	4	4	45	48	48
	5	39,000	91,182	4	4	4	44	48	48
	6	37,400	91,173	4	4	4	45	48	48
	7	37,500	91,100	4	4	4	45	48	48
	8	37,800	91,145	4	4	4	45	47	48
	9	38,300	91,182	4	4	4	46	48	48
	10	38,500	91,145	4	4	4	48	48	48
	11	37,800	91,164	4	4	4	48	48	48
	12	36,800	91,173	4	4	4	48	48	48
	13	35,600	91,154	4	4	4	48	48	48
	14	36,200	91,154	4	4	4	48	48	48
	15	35,900	91,182	4	4	4	48	48	48
	16	36,300	90,781	4	4	4	48	48	48
	17	35,500	90,635	4	4	4	48	48	48
	18	35,500	91,136	4	4	4	48	48	48
	19	35,700	91,182	4	4	4	48	48	48
	20	36,200	91,145	4	4	4	48	48	48
	21	34,700	91,173	4	4	4	48	48	48
	22	35,700	91,154	4	4	4	48	48	48
	23	35,400	91,154	4	4	4	48	48	48
	24	36,700	91,164	4	4	4	48	48	48
	25	37,900	91,145	4	4	4	48	48	48
	26	37,200	91,109	4	4	4	48	48	48
	27	36,400	91,164	4	4	4	48	48	48
	28	36,100	91,127	4	4	4	48	48	48
	29	36,000	91,145	4	4	4	48	48	48
	30	36,100	91,154	4	4	4	48	48	48
	31	36,700	91,164	4	4	4	48	48	48
AVERAGE		36,881	91,125	4	4	4	47	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.70 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
AUGUST	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	9,495	10,128	10,128	2.16E+08	26,110	589,000	4.325	0.942
	2	8,862	10,128	10,128	2.16E+08	27,090	589,000	4.233	0.957
	3	9,284	10,128	10,128	2.16E+08	27,650	589,000	4.295	0.991
	4	9,495	10,128	10,128	2.16E+08	27,230	589,000	4.325	0.983
	5	9,284	10,128	10,128	2.16E+08	27,300	589,000	4.295	0.978
	6	9,495	10,128	10,128	2.16E+08	26,180	589,000	4.325	0.945
	7	9,495	10,128	10,128	2.16E+08	26,250	589,000	4.325	0.948
	8	9,495	9,917	10,128	2.16E+08	26,460	589,000	4.295	0.948
	9	9,706	10,128	10,128	2.16E+08	26,810	589,000	4.356	0.975
	10	10,128	10,128	10,128	2.16E+08	26,950	589,000	4.418	0.993
	11	10,128	10,128	10,128	2.16E+08	26,460	589,000	4.418	0.975
	12	10,128	10,128	10,128	2.16E+08	25,760	589,000	4.418	0.950
	13	10,128	10,128	10,128	2.16E+08	24,920	589,000	4.418	0.919
	14	10,128	10,128	10,128	2.16E+08	25,340	589,000	4.418	0.934
	15	10,128	10,128	10,128	2.16E+08	25,130	589,000	4.418	0.926
	16	10,128	10,128	10,128	2.15E+08	25,410	589,000	4.418	0.937
	17	10,128	10,128	10,128	2.15E+08	24,850	589,000	4.418	0.916
	18	10,128	10,128	10,128	2.16E+08	24,850	589,000	4.418	0.916
	19	10,128	10,128	10,128	2.16E+08	24,990	589,000	4.418	0.921
	20	10,128	10,128	10,128	2.16E+08	25,340	589,000	4.418	0.934
	21	10,128	10,128	10,128	2.16E+08	24,290	589,000	4.418	0.895
	22	10,128	10,128	10,128	2.16E+08	24,990	589,000	4.418	0.921
	23	10,128	10,128	10,128	2.16E+08	24,780	589,000	4.418	0.913
	24	10,128	10,128	10,128	2.16E+08	25,690	589,000	4.418	0.947
	25	10,128	10,128	10,128	2.16E+08	26,530	589,000	4.418	0.978
	26	10,128	10,128	10,128	2.16E+08	26,040	589,000	4.418	0.960
	27	10,128	10,128	10,128	2.16E+08	25,480	589,000	4.418	0.939
	28	10,128	10,128	10,128	2.16E+08	25,270	589,000	4.418	0.932
	29	10,128	10,128	10,128	2.16E+08	25,200	589,000	4.418	0.929
	30	10,128	10,128	10,128	2.16E+08	25,270	589,000	4.418	0.932
	31	10,128	10,128	10,128	2.16E+08	25,690	589,000	4.418	0.947
AVERAGE		9,917	10,121	10,128	2.16E+08	25,816	589,000	4.386	0.945

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.70 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	37,100	91,164	4	4	4	48	48	48
2	37,100	91,072	4	4	4	48	48	48
3	37,500	91,145	4	4	4	48	48	48
4	37,400	91,100	4	4	4	48	47	48
5	38,500	91,154	4	4	4	48	48	48
6	36,500	91,145	4	4	4	48	48	48
7	37,300	91,182	4	4	4	48	48	48
8	37,900	91,154	4	4	4	48	48	48
9	38,300	91,164	4	4	4	48	48	48
10	39,300	91,164	4	4	4	48	48	48
11	39,000	91,173	4	4	4	48	48	48
12	38,200	91,154	4	4	4	48	48	48
13	38,800	91,145	4	4	4	42	42	48
14	38,100	65,436	4	4	4	40	34	40
15	35,900	0	4	1	1	0	0	0
16	35,200	0	1	1	1	0	0	0
17	34,900	0	1	1	1	0	0	0
18	34,700	0	1	1	1	0	0	0
19	34,300	0	1	1	1	0	0	0
20	34,100	0	1	1	1	0	0	0
21	35,100	0	1	1	1	0	0	0
22	35,200	0	1	1	1	0	0	0
23	36,400	0	1	1	1	0	0	0
24	33,800	8,518	1	4	4	31	0	29
25	34,200	44,278	4	4	4	48	0	43
26	35,800	61,761	4	4	4	48	8	48
27	37,100	87,908	4	4	4	48	48	48
28	37,800	90,744	4	4	4	48	48	48
29	37,200	91,164	4	4	4	48	48	48
30	37,500	91,164	4	4	4	48	48	48
AVERAGE	36,673	57,530	3	3	3	33	28	33

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
SEPTEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.16E+08	27,825	589,000	4.418	1.026
2	10,128	10,128	10,128	2.16E+08	27,825	589,000	4.418	1.026
3	10,128	10,128	10,128	2.16E+08	28,125	589,000	4.418	1.037
4	10,128	9,917	10,128	2.16E+08	28,050	589,000	4.387	1.027
5	10,128	10,128	10,128	2.16E+08	28,875	589,000	4.418	1.064
6	10,128	10,128	10,128	2.16E+08	27,375	589,000	4.418	1.009
7	10,128	10,128	10,128	2.16E+08	27,975	589,000	4.418	1.031
8	10,128	10,128	10,128	2.16E+08	28,425	589,000	4.418	1.048
9	10,128	10,128	10,128	2.16E+08	28,725	589,000	4.418	1.059
10	10,128	10,128	10,128	2.16E+08	29,475	589,000	4.418	1.087
11	10,128	10,128	10,128	2.16E+08	29,250	589,000	4.418	1.078
12	10,128	10,128	10,128	2.16E+08	28,650	589,000	4.418	1.056
13	8,862	8,862	10,128	2.16E+08	29,100	589,000	4.049	0.983
14	8,440	7,174	8,440	1.55E+08	28,575	589,000	3.497	0.834
15	0	0	0	0.00E+00	26,925	309,000	0.000	0.000
16	0	0	0	0.00E+00	26,400	169,000	0.000	0.000
17	0	0	0	0.00E+00	26,175	169,000	0.000	0.000
18	0	0	0	0.00E+00	26,025	169,000	0.000	0.000
19	0	0	0	0.00E+00	25,725	169,000	0.000	0.000
20	0	0	0	0.00E+00	25,575	169,000	0.000	0.000
21	0	0	0	0.00E+00	26,325	169,000	0.000	0.000
22	0	0	0	0.00E+00	26,400	169,000	0.000	0.000
23	0	0	0	0.00E+00	27,300	169,000	0.000	0.000
24	6,541	0	6,119	2.02E+07	25,350	449,000	1.403	0.297
25	10,128	0	9,073	1.05E+08	25,650	589,000	2.792	0.598
26	10,128	1,688	10,128	1.46E+08	26,850	589,000	3.190	0.715
27	10,128	10,128	10,128	2.08E+08	27,825	589,000	4.418	1.026
28	10,128	10,128	10,128	2.15E+08	28,350	589,000	4.418	1.045
29	10,128	10,128	10,128	2.16E+08	27,900	589,000	4.418	1.029
30	10,128	10,128	10,128	2.16E+08	28,125	589,000	4.418	1.037
AVERAGE	6,872	5,985	6,865	1.36E+08	27,505	463,000	2.853	0.670

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

OCTOBER	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	37,200	91,154	4	4	4	48	48	47
	2	37,300	91,164	4	4	4	48	48	48
	3	36,800	91,154	4	4	4	48	48	48
	4	37,900	91,136	4	4	4	48	48	48
	5	38,000	91,173	4	4	4	48	48	48
	6	38,300	91,164	4	4	4	48	48	48
	7	37,600	74,246	4	4	4	48	48	48
	8	37,500	87,753	4	4	4	48	48	48
	9	38,100	91,127	4	4	4	48	48	48
	10	37,900	91,164	4	4	4	48	48	48
	11	39,100	91,136	4	4	4	48	48	48
	12	39,800	91,027	4	4	4	48	48	48
	13	39,000	91,173	4	4	4	48	48	48
	14	39,300	91,164	4	4	4	48	48	48
	15	38,400	91,173	4	4	4	48	48	48
	16	39,200	91,164	4	4	4	48	48	48
	17	39,300	91,182	4	4	4	48	48	48
	18	31,500	91,145	4	4	4	48	48	48
	19	38,800	91,145	4	4	4	48	48	48
	20	39,200	91,173	4	4	4	48	48	48
	21	40,600	91,145	4	4	4	48	48	48
	22	39,600	91,164	4	4	4	48	48	48
	23	42,300	91,182	4	4	4	48	48	48
	24	41,600	91,164	4	4	4	48	48	48
	25	40,400	91,136	4	4	4	48	48	48
	26	39,700	91,145	4	4	4	48	48	48
	27	36,900	30,379	4	4	3	40	40	40
	28	33,300	0	2	2	2	0	0	0
	29	31,700	0	2	2	2	0	0	0
	30	31,700	0	2	2	2	0	0	0
	31	27,600	6,001	2	4	4	8	0	0
AVERAGE		37,600	76,969	4	4	4	42	42	42

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
OCTOBER	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	9,917	2.16E+08	31,620	589,000	4.387	1.158
	2	10,128	10,128	10,128	2.16E+08	31,705	589,000	4.418	1.169
	3	10,128	10,128	10,128	2.16E+08	31,280	589,000	4.418	1.153
	4	10,128	10,128	10,128	2.16E+08	32,215	589,000	4.418	1.188
	5	10,128	10,128	10,128	2.16E+08	32,300	589,000	4.418	1.191
	6	10,128	10,128	10,128	2.16E+08	32,555	589,000	4.418	1.200
	7	10,128	10,128	10,128	1.76E+08	31,960	589,000	4.418	1.178
	8	10,128	10,128	10,128	2.08E+08	31,875	589,000	4.418	1.175
	9	10,128	10,128	10,128	2.16E+08	32,385	589,000	4.418	1.194
	10	10,128	10,128	10,128	2.16E+08	32,215	589,000	4.418	1.188
	11	10,128	10,128	10,128	2.16E+08	33,235	589,000	4.418	1.225
	12	10,128	10,128	10,128	2.16E+08	33,830	589,000	4.418	1.247
	13	10,128	10,128	10,128	2.16E+08	33,150	589,000	4.418	1.222
	14	10,128	10,128	10,128	2.16E+08	33,405	589,000	4.418	1.231
	15	10,128	10,128	10,128	2.16E+08	32,640	589,000	4.418	1.203
	16	10,128	10,128	10,128	2.16E+08	33,320	589,000	4.418	1.228
	17	10,128	10,128	10,128	2.16E+08	33,405	589,000	4.418	1.231
	18	10,128	10,128	10,128	2.16E+08	26,775	589,000	4.418	0.987
	19	10,128	10,128	10,128	2.16E+08	32,980	589,000	4.418	1.216
	20	10,128	10,128	10,128	2.16E+08	33,320	589,000	4.418	1.228
	21	10,128	10,128	10,128	2.16E+08	34,510	589,000	4.418	1.272
	22	10,128	10,128	10,128	2.16E+08	33,660	589,000	4.418	1.241
	23	10,128	10,128	10,128	2.16E+08	35,955	589,000	4.418	1.325
	24	10,128	10,128	10,128	2.16E+08	35,360	589,000	4.418	1.304
	25	10,128	10,128	10,128	2.16E+08	34,340	589,000	4.418	1.266
	26	10,128	10,128	10,128	2.16E+08	33,745	589,000	4.418	1.244
	27	8,440	8,440	8,440	7.20E+07	31,365	542,333	3.390	0.887
	28	0	0	0	0.00E+00	28,305	309,000	0.000	0.000
	29	0	0	0	0.00E+00	26,945	309,000	0.000	0.000
	30	0	0	0	0.00E+00	26,945	309,000	0.000	0.000
	31	1,688	0	0	1.42E+07	23,460	495,667	0.207	0.040
AVERAGE		8,821	8,767	8,760	1.82E+08	31,960	557,387	3.820	1.045

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	27,300	56,818	4	4	4	47	26	8
2	28,500	91,154	4	4	4	48	48	48
3	29,800	91,173	4	4	4	48	48	48
4	30,100	91,136	4	4	4	48	48	48
5	23,600	91,154	4	4	4	48	48	48
6	31,300	91,127	4	4	4	48	48	48
7	32,500	91,173	4	4	4	48	48	48
8	33,600	91,164	4	4	4	48	48	48
9	35,100	91,136	4	4	4	48	48	48
10	35,400	91,164	4	4	4	48	48	48
11	36,200	91,136	4	4	4	48	48	48
12	37,400	91,164	4	4	4	48	48	48
13	37,700	91,164	4	4	4	48	48	48
14	39,000	91,164	4	4	4	48	48	48
15	35,100	91,164	4	4	4	48	48	48
16	36,900	91,173	4	4	4	48	48	48
17	35,500	91,173	4	4	4	48	48	48
18	36,400	91,182	4	4	4	48	48	48
19	36,800	91,173	4	4	4	48	48	48
20	37,600	91,145	4	4	4	48	48	48
21	36,300	91,164	4	4	4	48	48	48
22	37,500	91,154	4	4	4	48	48	48
23	37,600	91,164	4	4	4	48	48	48
24	36,500	91,164	4	4	4	48	48	48
25	36,900	91,182	4	4	4	48	48	48
26	37,300	91,154	4	4	4	48	48	48
27	37,800	91,173	4	4	4	48	48	48
28	37,700	91,154	4	4	4	48	48	48
29	36,800	91,136	4	4	4	48	48	48
30	37,400	91,164	4	4	4	48	48	48
AVERAGE	34,920	90,015	4	4	4	48	47	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

NOVEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	9,917	5,486	1,688	1.35E+08	23,205	589,000	2.485	0.481
2	10,128	10,128	10,128	2.16E+08	24,225	589,000	4.418	0.893
3	10,128	10,128	10,128	2.16E+08	25,330	589,000	4.418	0.934
4	10,128	10,128	10,128	2.16E+08	25,585	589,000	4.418	0.943
5	10,128	10,128	10,128	2.16E+08	20,060	589,000	4.418	0.739
6	10,128	10,128	10,128	2.16E+08	26,605	589,000	4.418	0.981
7	10,128	10,128	10,128	2.16E+08	27,625	589,000	4.418	1.018
8	10,128	10,128	10,128	2.16E+08	28,560	589,000	4.418	1.053
9	10,128	10,128	10,128	2.16E+08	29,835	589,000	4.418	1.100
10	10,128	10,128	10,128	2.16E+08	30,090	589,000	4.418	1.109
11	10,128	10,128	10,128	2.16E+08	30,770	589,000	4.418	1.134
12	10,128	10,128	10,128	2.16E+08	31,790	589,000	4.418	1.172
13	10,128	10,128	10,128	2.16E+08	32,045	589,000	4.418	1.181
14	10,128	10,128	10,128	2.16E+08	33,150	589,000	4.418	1.222
15	10,128	10,128	10,128	2.16E+08	29,835	589,000	4.418	1.100
16	10,128	10,128	10,128	2.16E+08	31,365	589,000	4.418	1.156
17	10,128	10,128	10,128	2.16E+08	30,175	589,000	4.418	1.112
18	10,128	10,128	10,128	2.16E+08	30,940	589,000	4.418	1.141
19	10,128	10,128	10,128	2.16E+08	31,280	589,000	4.418	1.153
20	10,128	10,128	10,128	2.16E+08	31,960	589,000	4.418	1.178
21	10,128	10,128	10,128	2.16E+08	30,855	589,000	4.418	1.137
22	10,128	10,128	10,128	2.16E+08	31,875	589,000	4.418	1.175
23	10,128	10,128	10,128	2.16E+08	31,960	589,000	4.418	1.178
24	10,128	10,128	10,128	2.16E+08	31,025	589,000	4.418	1.144
25	10,128	10,128	10,128	2.16E+08	31,365	589,000	4.418	1.156
26	10,128	10,128	10,128	2.16E+08	31,705	589,000	4.418	1.169
27	10,128	10,128	10,128	2.16E+08	32,130	589,000	4.418	1.184
28	10,128	10,128	10,128	2.16E+08	32,045	589,000	4.418	1.181
29	10,128	10,128	10,128	2.16E+08	31,280	589,000	4.418	1.153
30	10,128	10,128	10,128	2.16E+08	31,790	589,000	4.418	1.172
AVERAGE	10,121	9,973	9,847	2.13E+08	29,682	589,000	4.353	1.082

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 1

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	36,300	91,154	4	4	4	48	46	48
2	35,100	91,154	4	4	4	48	45	48
3	34,200	91,154	4	4	4	48	45	48
4	33,900	91,182	4	4	4	48	45	48
5	34,700	91,164	4	4	4	48	45	48
6	34,800	91,164	4	4	4	48	45	48
7	35,000	91,154	4	4	4	48	45	48
8	35,600	91,154	4	4	4	48	45	48
9	36,200	91,154	4	4	4	48	45	48
10	36,300	91,136	4	4	4	48	45	45
11	34,700	91,164	4	4	4	48	45	45
12	35,900	91,164	4	4	4	48	45	45
13	35,100	91,182	4	4	4	48	45	45
14	35,200	91,164	4	4	4	48	45	45
15	36,000	91,164	4	4	4	48	45	45
16	37,700	91,145	4	4	4	48	45	45
17	38,500	91,127	4	4	4	48	45	45
18	39,200	91,154	4	4	4	48	45	45
19	39,600	91,173	4	4	4	48	45	45
20	37,400	91,145	4	4	4	48	45	45
21	38,500	90,853	4	4	4	48	45	44
22	37,600	91,136	4	4	4	48	45	40
23	38,400	91,173	4	4	4	48	45	41
24	38,500	91,182	4	4	4	48	45	42
25	38,200	91,173	4	4	4	48	45	42
26	37,700	91,164	4	4	4	48	45	42
27	37,300	90,443	4	4	4	48	45	42
28	38,000	88,738	4	4	4	48	45	42
29	37,800	91,136	4	4	4	48	45	42
30	37,400	91,145	4	4	4	48	45	42
31	36,400	91,145	4	4	4	48	45	42
AVERAGE	36,684	91,046	4	4	4	48	45	45

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
DECEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	9,706	10,128	2.16E+08	29,766	589,000	4.356	1.082
2	10,128	9,495	10,128	2.16E+08	28,782	589,000	4.325	1.039
3	10,128	9,495	10,128	2.16E+08	28,044	589,000	4.325	1.012
4	10,128	9,495	10,128	2.16E+08	27,798	589,000	4.325	1.003
5	10,128	9,495	10,128	2.16E+08	28,454	589,000	4.325	1.027
6	10,128	9,495	10,128	2.16E+08	28,536	589,000	4.325	1.030
7	10,128	9,495	10,128	2.16E+08	28,700	589,000	4.325	1.036
8	10,128	9,495	10,128	2.16E+08	29,192	589,000	4.325	1.054
9	10,128	9,495	10,128	2.16E+08	29,684	589,000	4.325	1.071
10	10,128	9,495	9,495	2.16E+08	29,766	589,000	4.233	1.052
11	10,128	9,495	9,495	2.16E+08	28,454	589,000	4.233	1.005
12	10,128	9,495	9,495	2.16E+08	29,438	589,000	4.233	1.040
13	10,128	9,495	9,495	2.16E+08	28,782	589,000	4.233	1.017
14	10,128	9,495	9,495	2.16E+08	28,864	589,000	4.233	1.020
15	10,128	9,495	9,495	2.16E+08	29,520	589,000	4.233	1.043
16	10,128	9,495	9,495	2.16E+08	30,914	589,000	4.233	1.092
17	10,128	9,495	9,495	2.16E+08	31,570	589,000	4.233	1.115
18	10,128	9,495	9,495	2.16E+08	32,144	589,000	4.233	1.136
19	10,128	9,495	9,495	2.16E+08	32,472	589,000	4.233	1.147
20	10,128	9,495	9,495	2.16E+08	30,668	589,000	4.233	1.083
21	10,128	9,495	9,284	2.15E+08	31,570	589,000	4.203	1.107
22	10,128	9,495	8,440	2.16E+08	30,832	589,000	4.080	1.050
23	10,128	9,495	8,651	2.16E+08	31,488	589,000	4.111	1.080
24	10,128	9,495	8,862	2.16E+08	31,570	589,000	4.141	1.091
25	10,128	9,495	8,862	2.16E+08	31,324	589,000	4.141	1.083
26	10,128	9,495	8,862	2.16E+08	30,914	589,000	4.141	1.068
27	10,128	9,495	8,862	2.14E+08	30,586	589,000	4.141	1.057
28	10,128	9,495	8,862	2.10E+08	31,160	589,000	4.141	1.077
29	10,128	9,495	8,862	2.16E+08	30,996	589,000	4.141	1.071
30	10,128	9,495	8,862	2.16E+08	30,668	589,000	4.141	1.060
31	10,128	9,495	8,862	2.16E+08	29,848	589,000	4.141	1.032
AVERAGE	10,128	9,502	9,447	2.16E+08	30,081	589,000	4.228	1.061

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

JANUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	25,500	90,972	4	4	4	42	44	41
2	24,600	90,990	4	4	4	44	45	45
3	25,300	90,908	4	4	4	48	46	46
4	25,500	90,972	4	4	4	48	48	48
5	24,500	90,963	4	4	4	48	48	48
6	24,500	91,027	4	4	4	48	48	48
7	22,800	90,972	4	4	4	48	48	48
8	24,800	90,936	4	4	4	48	48	48
9	22,700	90,972	4	4	4	48	48	48
10	24,200	82,345	4	4	4	48	48	48
11	22,200	90,179	4	4	4	48	45	48
12	22,200	90,990	4	4	4	48	45	48
13	22,100	90,963	4	4	4	48	45	48
14	22,700	90,990	4	4	4	48	45	48
15	22,800	90,963	4	4	4	48	45	48
16	23,100	90,999	4	4	4	48	45	48
17	23,300	90,936	4	4	4	48	46	48
18	23,900	91,018	4	4	4	45	48	48
19	24,200	91,036	4	4	4	47	48	48
20	22,400	91,045	4	4	4	45	48	45
21	24,200	90,999	4	4	4	48	48	48
22	23,600	90,926	4	4	4	48	48	48
23	24,200	90,926	4	4	4	48	42	48
24	23,800	90,972	4	4	4	48	39	48
25	23,600	91,027	4	4	4	48	44	48
26	24,600	90,972	4	4	4	48	48	42
27	26,300	90,981	4	4	4	48	48	48
28	25,700	90,963	4	4	4	40	48	48
29	25,900	91,018	4	4	4	45	48	48
30	24,500	91,027	4	4	4	39	42	42
31	23,200	90,990	4	4	4	40	42	42
AVERAGE	23,965	90,677	4	4	4	47	46	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

JANUARY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	8,862	9,284	8,651	2.16E+08	20,910	589,000	3.896	0.680
	2	9,284	9,495	9,495	2.16E+08	20,172	589,000	4.111	0.692
	3	10,128	9,706	9,706	2.15E+08	20,746	589,000	4.295	0.744
	4	10,128	10,128	10,128	2.16E+08	20,910	589,000	4.418	0.771
	5	10,128	10,128	10,128	2.16E+08	20,090	589,000	4.418	0.741
	6	10,128	10,128	10,128	2.16E+08	20,090	589,000	4.418	0.741
	7	10,128	10,128	10,128	2.16E+08	18,696	589,000	4.418	0.689
	8	10,128	10,128	10,128	2.16E+08	20,336	589,000	4.418	0.750
	9	10,128	10,128	10,128	2.16E+08	18,614	589,000	4.418	0.686
	10	10,128	10,128	10,128	1.95E+08	19,844	589,000	4.418	0.732
	11	10,128	9,495	10,128	2.14E+08	18,204	589,000	4.325	0.657
	12	10,128	9,495	10,128	2.16E+08	18,204	589,000	4.325	0.657
	13	10,128	9,495	10,128	2.16E+08	18,122	589,000	4.325	0.654
	14	10,128	9,495	10,128	2.16E+08	18,614	589,000	4.325	0.672
	15	10,128	9,495	10,128	2.16E+08	18,696	589,000	4.325	0.675
	16	10,128	9,495	10,128	2.16E+08	18,942	589,000	4.325	0.684
	17	10,128	9,706	10,128	2.16E+08	19,106	589,000	4.356	0.695
	18	9,495	10,128	10,128	2.16E+08	19,598	589,000	4.325	0.707
	19	9,917	10,128	10,128	2.16E+08	19,844	589,000	4.387	0.726
	20	9,495	10,128	9,495	2.16E+08	18,368	589,000	4.233	0.649
	21	10,128	10,128	10,128	2.16E+08	19,844	589,000	4.418	0.732
	22	10,128	10,128	10,128	2.15E+08	19,352	589,000	4.418	0.713
	23	10,128	8,862	10,128	2.15E+08	19,844	589,000	4.233	0.701
	24	10,128	8,229	10,128	2.16E+08	19,516	589,000	4.141	0.674
	25	10,128	9,284	10,128	2.16E+08	19,352	589,000	4.295	0.694
	26	10,128	10,128	8,862	2.16E+08	20,172	589,000	4.233	0.713
	27	10,128	10,128	10,128	2.16E+08	21,566	589,000	4.418	0.795
	28	8,440	10,128	10,128	2.16E+08	21,074	589,000	4.172	0.734
	29	9,495	10,128	10,128	2.16E+08	21,238	589,000	4.325	0.767
	30	8,229	8,862	8,862	2.16E+08	20,090	589,000	3.773	0.633
	31	8,440	8,862	8,862	2.16E+08	19,024	589,000	3.804	0.604
AVERAGE		9,822	9,720	9,903	2.15E+08	19,651	589,000	4.281	0.702

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	23,800	90,972	4	4	4	47	48	45
2	24,600	97,018	4	4	4	48	47	41
3	25,300	90,945	4	4	4	48	48	45
4	26,000	91,018	4	4	4	46	48	45
5	25,100	91,027	4	4	4	45	48	45
6	25,600	91,036	4	4	4	46	48	45
7	27,300	90,981	4	4	4	48	48	45
8	25,700	90,972	4	4	4	48	48	45
9	24,900	90,972	4	4	4	48	48	45
10	25,900	90,908	4	4	4	48	48	45
11	26,800	90,972	4	4	4	48	48	46
12	27,800	90,954	4	4	4	48	48	48
13	26,400	91,009	4	4	4	48	48	48
14	26,700	91,127	4	4	4	48	48	48
15	26,800	91,154	4	4	4	48	48	48
16	28,200	91,182	4	4	4	48	48	48
17	26,900	91,164	4	4	4	48	48	48
18	27,600	91,164	4	4	4	48	48	48
19	26,300	91,145	4	4	4	48	48	47
20	25,100	91,127	4	4	4	48	48	48
21	25,000	91,164	4	4	4	48	39	48
22	24,500	91,154	4	4	4	42	48	47
23	25,200	91,173	4	4	4	48	48	48
24	24,400	91,173	4	4	4	47	42	47
25	23,600	91,164	4	4	4	48	40	48
26	24,000	91,145	4	4	4	48	41	48
27	25,400	91,182	4	4	4	48	38	48
28	26,600	91,145	4	4	4	48	43	48
AVERAGE	25,768	91,291	4	4	4	47	46	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
FEBRUARY DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	9,917	10,128	9,495	2.16E+08	19,754	589,000	4.295	0.708
2	10,128	9,917	8,651	2.30E+08	20,418	589,000	4.172	0.711
3	10,128	10,128	9,495	2.16E+08	20,999	589,000	4.325	0.758
4	9,706	10,128	9,495	2.16E+08	21,580	589,000	4.264	0.768
5	9,495	10,128	9,495	2.16E+08	20,833	589,000	4.233	0.736
6	9,706	10,128	9,495	2.16E+08	21,248	589,000	4.264	0.756
7	10,128	10,128	9,495	2.16E+08	22,659	589,000	4.325	0.818
8	10,128	10,128	9,495	2.16E+08	21,331	589,000	4.325	0.770
9	10,128	10,128	9,495	2.16E+08	20,667	589,000	4.325	0.746
10	10,128	10,128	9,495	2.15E+08	21,497	589,000	4.325	0.776
11	10,128	10,128	9,706	2.16E+08	22,244	589,000	4.356	0.809
12	10,128	10,128	10,128	2.16E+08	23,074	589,000	4.418	0.851
13	10,128	10,128	10,128	2.16E+08	21,912	589,000	4.418	0.808
14	10,128	10,128	10,128	2.16E+08	22,161	589,000	4.418	0.817
15	10,128	10,128	10,128	2.16E+08	22,244	589,000	4.418	0.820
16	10,128	10,128	10,128	2.16E+08	23,406	589,000	4.418	0.863
17	10,128	10,128	10,128	2.16E+08	22,327	589,000	4.418	0.823
18	10,128	10,128	10,128	2.16E+08	22,908	589,000	4.418	0.844
19	10,128	10,128	9,917	2.16E+08	21,829	589,000	4.387	0.799
20	10,128	10,128	10,128	2.16E+08	20,833	589,000	4.418	0.768
21	10,128	8,229	10,128	2.16E+08	20,750	589,000	4.141	0.717
22	8,862	10,128	9,917	2.16E+08	20,335	589,000	4.203	0.713
23	10,128	10,128	10,128	2.16E+08	20,916	589,000	4.418	0.771
24	9,917	8,862	9,917	2.16E+08	20,252	589,000	4.172	0.705
25	10,128	8,440	10,128	2.16E+08	19,588	589,000	4.172	0.682
26	10,128	8,651	10,128	2.16E+08	19,920	589,000	4.203	0.699
27	10,128	8,018	10,128	2.16E+08	21,082	589,000	4.111	0.723
28	10,128	9,073	10,128	2.16E+08	22,078	589,000	4.264	0.786
AVERAGE	10,015	9,781	9,834	2.16E+08	21,387	589,000	4.308	0.769

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	26,800	91,100	4	4	4	48	48	48
	2	25,700	91,191	4	4	4	48	48	48
	3	26,800	91,182	4	4	4	48	48	48
	4	27,000	91,136	4	4	4	48	48	48
	5	30,300	91,145	4	4	4	48	48	48
	6	28,800	91,164	4	4	4	48	48	48
	7	28,400	91,145	4	4	4	42	48	48
	8	31,500	91,154	4	4	4	42	48	48
	9	29,800	90,799	4	4	4	39	48	48
	10	32,900	63,001	4	4	4	34	34	34
	11	31,700	91,118	4	4	4	44	44	42
	12	29,600	91,136	4	4	4	48	48	45
	13	30,900	91,173	4	4	4	48	48	45
	14	32,100	91,154	4	4	4	48	48	45
	15	32,100	91,109	4	4	4	48	48	46
	16	29,100	91,127	4	4	4	48	42	48
	17	30,800	91,100	4	4	4	48	48	48
	18	29,500	91,154	4	4	4	48	48	48
	19	30,800	91,182	4	4	4	48	48	48
	20	28,600	91,182	4	4	4	48	48	48
	21	28,100	91,136	4	4	4	48	48	48
	22	28,800	91,164	4	4	4	48	48	48
	23	28,500	91,182	4	4	4	48	48	48
	24	26,700	91,164	4	4	4	48	48	48
	25	27,000	91,182	4	4	4	48	48	48
	26	27,400	91,145	4	4	4	48	48	48
	27	27,000	91,164	4	4	4	48	48	48
	28	26,100	91,164	4	4	4	48	48	48
	29	26,400	91,173	4	4	4	48	48	48
	30	25,400	91,173	4	4	4	48	48	48
	31	28,000	91,182	4	4	4	48	48	48
AVERAGE		28,794	90,235	4	4	4	47	47	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.85 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

MARCH	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	22,780	589,000	4.418	0.840
	2	10,128	10,128	10,128	2.16E+08	21,845	589,000	4.418	0.805
	3	10,128	10,128	10,128	2.16E+08	22,780	589,000	4.418	0.840
	4	10,128	10,128	10,128	2.16E+08	22,950	589,000	4.418	0.846
	5	10,128	10,128	10,128	2.16E+08	25,755	589,000	4.418	0.949
	6	10,128	10,128	10,128	2.16E+08	24,480	589,000	4.418	0.902
	7	8,862	10,128	10,128	2.16E+08	24,140	589,000	4.233	0.853
	8	8,862	10,128	10,128	2.16E+08	26,775	589,000	4.233	0.946
	9	8,229	10,128	10,128	2.15E+08	25,330	589,000	4.141	0.875
	10	7,174	7,174	7,174	1.49E+08	27,965	589,000	3.129	0.730
	11	9,284	9,284	8,862	2.16E+08	26,945	589,000	3.988	0.897
	12	10,128	10,128	9,495	2.16E+08	25,160	589,000	4.325	0.908
	13	10,128	10,128	9,495	2.16E+08	26,265	589,000	4.325	0.948
	14	10,128	10,128	9,495	2.16E+08	27,285	589,000	4.325	0.985
	15	10,128	10,128	9,706	2.16E+08	27,285	589,000	4.356	0.992
	16	10,128	8,862	10,128	2.16E+08	24,735	589,000	4.233	0.874
	17	10,128	10,128	10,128	2.16E+08	26,180	589,000	4.418	0.965
	18	10,128	10,128	10,128	2.16E+08	25,075	589,000	4.418	0.924
	19	10,128	10,128	10,128	2.16E+08	26,180	589,000	4.418	0.965
	20	10,128	10,128	10,128	2.16E+08	24,310	589,000	4.418	0.896
	21	10,128	10,128	10,128	2.16E+08	23,885	589,000	4.418	0.880
	22	10,128	10,128	10,128	2.16E+08	24,480	589,000	4.418	0.902
	23	10,128	10,128	10,128	2.16E+08	24,225	589,000	4.418	0.893
	24	10,128	10,128	10,128	2.16E+08	22,695	589,000	4.418	0.837
	25	10,128	10,128	10,128	2.16E+08	22,950	589,000	4.418	0.846
	26	10,128	10,128	10,128	2.16E+08	23,290	589,000	4.418	0.859
	27	10,128	10,128	10,128	2.16E+08	22,950	589,000	4.418	0.846
	28	10,128	10,128	10,128	2.16E+08	22,185	589,000	4.418	0.818
	29	10,128	10,128	10,128	2.16E+08	22,440	589,000	4.418	0.827
	30	10,128	10,128	10,128	2.16E+08	21,590	589,000	4.418	0.796
	31	10,128	10,128	10,128	2.16E+08	23,800	589,000	4.418	0.877
AVERAGE		9,863	9,965	9,917	2.14E+08	24,475	589,000	4.324	0.881

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.85 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	29,110	91,136	4	4	4	48	48	48
	2	28,300	91,164	4	4	4	48	48	47
	3	29,000	91,182	4	4	4	48	48	48
	4	30,100	91,173	4	4	4	48	48	48
	5	30,800	91,154	4	4	4	48	48	45
	6	31,000	89,595	4	4	4	48	48	47
	7	31,200	91,118	4	4	4	48	48	45
	8	31,900	91,136	4	4	4	48	48	45
	9	31,900	91,164	4	4	4	48	48	45
	10	29,900	91,164	4	4	4	48	48	45
	11	29,000	91,173	4	4	4	47	48	45
	12	27,100	91,182	4	4	4	44	48	45
	13	27,300	91,182	4	4	4	45	48	45
	14	27,200	91,173	4	4	4	45	48	45
	15	27,700	91,191	4	4	4	47	48	44
	16	28,700	91,182	4	4	4	48	48	45
	17	27,700	91,182	4	4	4	48	48	45
	18	28,200	91,182	4	4	4	48	48	45
	19	28,100	91,173	4	4	4	48	48	46
	20	27,700	91,173	4	4	4	48	48	48
	21	28,900	91,164	4	4	4	48	48	48
	22	28,600	91,154	4	4	4	46	45	48
	23	29,100	91,191	4	4	4	46	45	48
	24	28,500	91,191	4	4	4	48	45	48
	25	27,900	91,182	4	4	4	48	45	48
	26	28,300	91,173	4	4	4	48	45	48
	27	27,500	91,182	4	4	4	48	46	48
	28	27,900	91,173	4	4	4	48	48	48
	29	27,500	91,191	4	4	4	48	46	48
	30	28,000	91,164	4	4	4	48	46	48
AVERAGE		28,804	91,118	4	4	4	47	47	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
APRIL	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	23,870	589,000	4.418	0.880
	2	10,128	10,128	9,917	2.16E+08	23,206	589,000	4.387	0.850
	3	10,128	10,128	10,128	2.16E+08	23,780	589,000	4.418	0.877
	4	10,128	10,128	10,128	2.16E+08	24,682	589,000	4.418	0.910
	5	10,128	10,128	9,495	2.16E+08	25,256	589,000	4.325	0.912
	6	10,128	10,128	9,917	2.12E+08	25,420	589,000	4.387	0.931
	7	10,128	10,128	9,495	2.16E+08	25,584	589,000	4.325	0.923
	8	10,128	10,128	9,495	2.16E+08	26,158	589,000	4.325	0.944
	9	10,128	10,128	9,495	2.16E+08	26,158	589,000	4.325	0.944
	10	10,128	10,128	9,495	2.16E+08	24,518	589,000	4.325	0.885
	11	9,917	10,128	9,495	2.16E+08	23,780	589,000	4.295	0.852
	12	9,284	10,128	9,495	2.16E+08	22,222	589,000	4.203	0.779
	13	9,495	10,128	9,495	2.16E+08	22,386	589,000	4.233	0.791
	14	9,495	10,128	9,495	2.16E+08	22,304	589,000	4.233	0.788
	15	9,917	10,128	9,284	2.16E+08	22,714	589,000	4.264	0.808
	16	10,128	10,128	9,495	2.16E+08	23,534	589,000	4.325	0.849
	17	10,128	10,128	9,495	2.16E+08	22,714	589,000	4.325	0.820
	18	10,128	10,128	9,495	2.16E+08	23,124	589,000	4.325	0.835
	19	10,128	10,128	9,706	2.16E+08	23,042	589,000	4.356	0.838
	20	10,128	10,128	10,128	2.16E+08	22,714	589,000	4.418	0.837
	21	10,128	10,128	10,128	2.16E+08	23,698	589,000	4.418	0.874
	22	9,706	9,495	10,128	2.16E+08	23,452	589,000	4.264	0.835
	23	9,706	9,495	10,128	2.16E+08	23,862	589,000	4.264	0.849
	24	10,128	9,495	10,128	2.16E+08	23,370	589,000	4.325	0.844
	25	10,128	9,495	10,128	2.16E+08	22,878	589,000	4.325	0.826
	26	10,128	9,495	10,128	2.16E+08	23,206	589,000	4.325	0.838
	27	10,128	9,706	10,128	2.16E+08	22,550	589,000	4.356	0.820
	28	10,128	10,128	10,128	2.16E+08	22,878	589,000	4.418	0.843
	29	10,128	9,706	10,128	2.16E+08	22,550	589,000	4.356	0.820
	30	10,128	9,706	10,128	2.16E+08	22,960	589,000	4.356	0.835
AVERAGE		10,015	9,980	9,819	2.16E+08	23,619	589,000	4.335	0.854

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	28,500	91,182	4	4	4	48	48	48
	2	28,400	91,182	4	4	4	48	45	48
	3	28,500	91,182	4	4	4	48	45	48
	4	27,100	91,173	4	4	4	48	45	48
	5	27,300	91,191	4	4	4	48	45	48
	6	27,000	91,164	4	4	4	48	45	48
	7	27,300	91,173	4	4	4	48	45	48
	8	27,500	91,182	4	4	4	48	46	48
	9	25,600	91,164	4	4	4	48	48	48
	10	23,500	91,182	4	4	4	48	46	48
	11	22,500	91,191	4	4	4	48	45	48
	12	22,700	91,173	4	4	4	48	45	48
	13	22,900	91,182	4	4	4	48	45	48
	14	23,800	91,182	4	4	4	48	45	48
	15	23,800	91,182	4	4	4	48	45	48
	16	24,200	91,182	4	4	4	48	45	48
	17	26,100	91,173	4	4	4	48	46	48
	18	25,500	91,173	4	4	4	48	48	48
	19	24,200	91,173	4	4	4	48	48	48
	20	25,900	91,173	4	4	4	48	48	48
	21	26,600	91,191	4	4	4	48	48	48
	22	27,200	91,191	4	4	4	48	48	48
	23	27,600	91,136	4	4	4	48	48	48
	24	28,000	91,182	4	4	4	48	48	48
	25	29,000	91,182	4	4	4	48	48	48
	26	29,900	91,182	4	4	4	48	48	48
	27	30,100	91,182	4	4	4	48	47	48
	28	29,500	91,173	4	4	4	48	48	48
	29	29,700	91,191	4	4	4	48	46	48
	30	29,500	91,100	4	4	4	48	47	48
	31	29,500	91,173	4	4	4	48	47	48
AVERAGE		26,739	91,175	4	4	4	48	46	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MAY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	22,230	589,000	4.418	0.819
	2	10,128	9,495	10,128	2.16E+08	22,152	589,000	4.325	0.800
	3	10,128	9,495	10,128	2.16E+08	22,230	589,000	4.325	0.802
	4	10,128	9,495	10,128	2.16E+08	21,138	589,000	4.325	0.763
	5	10,128	9,495	10,128	2.16E+08	21,294	589,000	4.325	0.769
	6	10,128	9,495	10,128	2.16E+08	21,060	589,000	4.325	0.760
	7	10,128	9,495	10,128	2.16E+08	21,294	589,000	4.325	0.769
	8	10,128	9,706	10,128	2.16E+08	21,450	589,000	4.356	0.780
	9	10,128	10,128	10,128	2.16E+08	19,968	589,000	4.418	0.736
	10	10,128	9,706	10,128	2.16E+08	18,330	589,000	4.356	0.666
	11	10,128	9,495	10,128	2.16E+08	17,550	589,000	4.325	0.633
	12	10,128	9,495	10,128	2.16E+08	17,706	589,000	4.325	0.639
	13	10,128	9,495	10,128	2.16E+08	17,862	589,000	4.325	0.645
	14	10,128	9,495	10,128	2.16E+08	18,564	589,000	4.325	0.670
	15	10,128	9,495	10,128	2.16E+08	18,564	589,000	4.325	0.670
	16	10,128	9,495	10,128	2.16E+08	18,876	589,000	4.325	0.681
	17	10,128	9,706	10,128	2.16E+08	20,358	589,000	4.356	0.740
	18	10,128	10,128	10,128	2.16E+08	19,890	589,000	4.418	0.733
	19	10,128	10,128	10,128	2.16E+08	18,876	589,000	4.418	0.696
	20	10,128	10,128	10,128	2.16E+08	20,202	589,000	4.418	0.745
	21	10,128	10,128	10,128	2.16E+08	20,748	589,000	4.418	0.765
	22	10,128	10,128	10,128	2.16E+08	21,216	589,000	4.418	0.782
	23	10,128	10,128	10,128	2.16E+08	21,528	589,000	4.418	0.794
	24	10,128	10,128	10,128	2.16E+08	21,840	589,000	4.418	0.805
	25	10,128	10,128	10,128	2.16E+08	22,620	589,000	4.418	0.834
	26	10,128	10,128	10,128	2.16E+08	23,322	589,000	4.418	0.860
	27	10,128	9,917	10,128	2.16E+08	23,478	589,000	4.387	0.859
	28	10,128	10,128	10,128	2.16E+08	23,010	589,000	4.418	0.848
	29	10,128	9,706	10,128	2.16E+08	23,166	589,000	4.356	0.842
	30	10,128	9,917	10,128	2.16E+08	23,010	589,000	4.387	0.842
	31	10,128	9,917	10,128	2.16E+08	23,010	589,000	4.387	0.842
AVERAGE		10,128	9,808	10,128	2.16E+08	20,856	589,000	4.371	0.761

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	29,800	91,154	4	4	4	48	47	48
	2	29,100	91,145	4	4	4	48	47	48
	3	28,300	91,173	4	4	4	48	48	48
	4	29,200	91,173	4	4	4	48	48	48
	5	28,700	91,182	4	4	4	48	48	48
	6	27,900	91,173	4	4	4	48	48	48
	7	27,900	91,191	4	4	4	48	48	48
	8	27,900	91,191	4	4	4	48	48	48
	9	28,400	91,191	4	4	4	48	48	48
	10	27,900	91,182	4	4	4	48	48	48
	11	28,500	91,164	4	4	4	48	48	48
	12	29,000	91,173	4	4	4	48	48	48
	13	28,100	91,164	4	4	4	48	45	48
	14	28,800	91,182	4	4	4	48	45	48
	15	28,100	91,164	4	4	4	48	45	48
	16	28,600	91,182	4	4	4	48	45	48
	17	28,500	91,173	4	4	4	48	43	48
	18	28,500	91,173	4	4	4	48	42	48
	19	29,000	91,164	4	4	4	48	42	48
	20	29,300	91,191	4	4	4	48	43	48
	21	27,600	91,182	4	4	4	48	48	48
	22	27,700	91,191	4	4	4	48	48	48
	23	27,700	91,182	4	4	4	48	48	48
	24	27,400	91,191	4	4	4	47	48	48
	25	28,200	91,182	4	4	4	43	48	48
	26	27,400	91,182	4	4	4	46	48	48
	27	27,900	91,173	4	4	4	46	48	48
	28	27,700	91,164	4	4	4	48	48	48
	29	28,600	90,334	4	4	4	48	48	48
	30	28,800	91,164	4	4	4	48	48	48
AVERAGE		28,350	91,147	4	4	4	48	47	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JUNE	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	9,917	10,128	2.16E+08	22,350	589,000	4.387	0.818
	2	10,128	9,917	10,128	2.16E+08	21,825	589,000	4.387	0.799
	3	10,128	10,128	10,128	2.16E+08	21,225	589,000	4.418	0.782
	4	10,128	10,128	10,128	2.16E+08	21,900	589,000	4.418	0.807
	5	10,128	10,128	10,128	2.16E+08	21,525	589,000	4.418	0.793
	6	10,128	10,128	10,128	2.16E+08	20,925	589,000	4.418	0.771
	7	10,128	10,128	10,128	2.16E+08	20,925	589,000	4.418	0.771
	8	10,128	10,128	10,128	2.16E+08	20,925	589,000	4.418	0.771
	9	10,128	10,128	10,128	2.16E+08	21,300	589,000	4.418	0.785
	10	10,128	10,128	10,128	2.16E+08	20,925	589,000	4.418	0.771
	11	10,128	10,128	10,128	2.16E+08	21,375	589,000	4.418	0.788
	12	10,128	10,128	10,128	2.16E+08	21,750	589,000	4.418	0.802
	13	10,128	9,495	10,128	2.16E+08	21,075	589,000	4.325	0.761
	14	10,128	9,495	10,128	2.16E+08	21,600	589,000	4.325	0.780
	15	10,128	9,495	10,128	2.16E+08	21,075	589,000	4.325	0.761
	16	10,128	9,495	10,128	2.16E+08	21,450	589,000	4.325	0.774
	17	10,128	9,073	10,128	2.16E+08	21,375	589,000	4.264	0.761
	18	10,128	8,862	10,128	2.16E+08	21,375	589,000	4.233	0.755
	19	10,128	8,862	10,128	2.16E+08	21,750	589,000	4.233	0.768
	20	10,128	9,073	10,128	2.16E+08	21,975	589,000	4.264	0.782
	21	10,128	10,128	10,128	2.16E+08	20,700	589,000	4.418	0.763
	22	10,128	10,128	10,128	2.16E+08	20,775	589,000	4.418	0.766
	23	10,128	10,128	10,128	2.16E+08	20,775	589,000	4.418	0.766
	24	9,917	10,128	10,128	2.16E+08	20,550	589,000	4.387	0.752
	25	9,073	10,128	10,128	2.16E+08	21,150	589,000	4.264	0.753
	26	9,706	10,128	10,128	2.16E+08	20,550	589,000	4.356	0.747
	27	9,706	10,128	10,128	2.16E+08	20,925	589,000	4.356	0.761
	28	10,128	10,128	10,128	2.16E+08	20,775	589,000	4.418	0.766
	29	10,128	10,128	10,128	2.14E+08	21,450	589,000	4.418	0.791
	30	10,128	10,128	10,128	2.16E+08	21,600	589,000	4.418	0.796
AVERAGE		10,058	9,875	10,128	2.16E+08	21,263	589,000	4.370	0.775

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.75 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	28,300	90,653	4	4	4	48	48	48
	2	28,600	91,091	4	4	4	48	48	48
	3	29,100	91,182	4	4	4	48	48	48
	4	31,200	91,164	4	4	4	48	48	48
	5	30,600	91,127	4	4	4	48	48	48
	6	31,000	91,145	4	4	4	48	48	48
	7	30,400	91,182	4	4	4	48	48	48
	8	27,400	91,173	4	4	4	48	48	48
	9	27,700	91,191	4	4	4	48	45	48
	10	28,600	91,182	4	4	4	48	45	48
	11	28,500	91,173	4	4	4	48	45	48
	12	28,700	91,182	4	4	4	48	45	48
	13	29,500	91,063	4	4	4	48	45	48
	14	29,400	91,091	4	4	4	48	45	48
	15	29,800	91,154	4	4	4	46	45	48
	16	30,200	91,100	4	4	4	45	46	48
	17	31,200	91,072	4	4	4	45	48	48
	18	31,000	91,145	4	4	4	45	48	48
	19	31,000	91,182	4	4	4	46	48	48
	20	31,900	91,191	4	4	4	48	48	48
	21	31,900	91,182	4	4	4	48	48	48
	22	32,900	91,145	4	4	4	48	48	48
	23	31,700	91,127	4	4	4	48	48	48
	24	33,900	91,136	4	4	4	48	48	48
	25	34,300	91,164	4	4	4	48	48	48
	26	34,400	91,173	4	4	4	48	46	48
	27	36,100	91,164	4	4	4	48	45	48
	28	36,500	91,173	4	4	4	48	45	48
	29	38,200	91,173	4	4	4	48	45	48
	30	38,600	91,182	4	4	4	48	46	48
	31	38,800	91,182	4	4	4	48	48	48
AVERAGE		31,658	91,137	4	4	4	48	47	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JULY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.15E+08	20,942	589,000	4.418	0.772
	2	10,128	10,128	10,128	2.16E+08	21,164	589,000	4.418	0.780
	3	10,128	10,128	10,128	2.16E+08	21,534	589,000	4.418	0.794
	4	10,128	10,128	10,128	2.16E+08	23,088	589,000	4.418	0.851
	5	10,128	10,128	10,128	2.16E+08	22,644	589,000	4.418	0.835
	6	10,128	10,128	10,128	2.16E+08	22,940	589,000	4.418	0.846
	7	10,128	10,128	10,128	2.16E+08	22,496	589,000	4.418	0.829
	8	10,128	10,128	10,128	2.16E+08	20,276	589,000	4.418	0.747
	9	10,128	9,495	10,128	2.16E+08	20,498	589,000	4.325	0.740
	10	10,128	9,495	10,128	2.16E+08	21,164	589,000	4.325	0.764
	11	10,128	9,495	10,128	2.16E+08	21,090	589,000	4.325	0.761
	12	10,128	9,495	10,128	2.16E+08	21,238	589,000	4.325	0.767
	13	10,128	9,495	10,128	2.16E+08	21,830	589,000	4.325	0.788
	14	10,128	9,495	10,128	2.16E+08	21,756	589,000	4.325	0.785
	15	9,706	9,495	10,128	2.16E+08	22,052	589,000	4.264	0.785
	16	9,495	9,706	10,128	2.16E+08	22,348	589,000	4.264	0.795
	17	9,495	10,128	10,128	2.16E+08	23,088	589,000	4.325	0.833
	18	9,495	10,128	10,128	2.16E+08	22,940	589,000	4.325	0.828
	19	9,706	10,128	10,128	2.16E+08	22,940	589,000	4.356	0.834
	20	10,128	10,128	10,128	2.16E+08	23,606	589,000	4.418	0.870
	21	10,128	10,128	10,128	2.16E+08	23,606	589,000	4.418	0.870
	22	10,128	10,128	10,128	2.16E+08	24,346	589,000	4.418	0.897
	23	10,128	10,128	10,128	2.16E+08	23,458	589,000	4.418	0.865
	24	10,128	10,128	10,128	2.16E+08	25,086	589,000	4.418	0.925
	25	10,128	10,128	10,128	2.16E+08	25,382	589,000	4.418	0.936
	26	10,128	9,706	10,128	2.16E+08	25,456	589,000	4.356	0.925
	27	10,128	9,495	10,128	2.16E+08	26,714	589,000	4.325	0.964
	28	10,128	9,495	10,128	2.16E+08	27,010	589,000	4.325	0.975
	29	10,128	9,495	10,128	2.16E+08	28,268	589,000	4.325	1.020
	30	10,128	9,706	10,128	2.16E+08	28,564	589,000	4.356	1.038
	31	10,128	10,128	10,128	2.16E+08	28,712	589,000	4.418	1.058
AVERAGE		10,040	9,883	10,128	2.16E+08	23,427	589,000	4.369	0.854

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.74 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	38,200	91,145	4	4	4	48	48	48
	2	38,900	91,154	4	4	4	48	48	48
	3	39,600	91,127	4	4	4	48	48	48
	4	39,100	91,154	4	4	4	48	48	48
	5	38,500	91,164	4	4	4	48	48	48
	6	36,300	91,136	4	4	4	48	48	48
	7	35,300	91,154	4	4	4	48	48	48
	8	35,800	91,136	4	4	4	48	48	48
	9	36,900	25,262	4	2	2	16	16	16
	10	36,100	0	2	2	2	0	0	0
	11	35,000	0	2	2	2	0	0	0
	12	35,200	0	2	2	2	0	0	0
	13	34,900	0	2	2	2	0	0	0
	14	35,200	0	2	2	2	0	0	0
	15	35,000	10,397	2	2	3	6	3	0
	16	34,800	20,064	4	4	3	11	6	0
	17	35,700	0	2	2	2	0	0	0
	18	35,200	0	2	2	2	0	0	0
	19	35,400	447	2	2	2	0	0	0
	20	36,100	33,334	2	2	3	32	8	7
	21	34,900	83,065	4	4	4	48	47	46
	22	36,200	77,848	4	4	4	48	48	48
	23	35,300	64,032	4	4	4	48	45	48
	24	36,300	78,806	4	4	4	48	45	48
	25	38,100	90,926	4	4	4	48	45	48
	26	38,000	91,063	4	4	4	48	46	48
	27	37,300	91,154	4	4	4	48	48	45
	28	38,100	91,154	4	4	4	48	48	48
	29	37,800	91,109	4	4	4	48	48	47
	30	38,200	91,154	4	4	4	48	48	48
	31	38,800	91,164	4	4	4	48	48	48
AVERAGE		36,652	56,779	3	3	3	32	30	30

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.72 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower, cu m/s			Heat	Calc	CW Flow	Calc Drift	
AUGUST	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	27,504	589,000	4.418	1.014
	2	10,128	10,128	10,128	2.16E+08	28,008	589,000	4.418	1.032
	3	10,128	10,128	10,128	2.16E+08	28,512	589,000	4.418	1.051
	4	10,128	10,128	10,128	2.16E+08	28,152	589,000	4.418	1.038
	5	10,128	10,128	10,128	2.16E+08	27,720	589,000	4.418	1.022
	6	10,128	10,128	10,128	2.16E+08	26,136	589,000	4.418	0.963
	7	10,128	10,128	10,128	2.16E+08	25,416	589,000	4.418	0.937
	8	10,128	10,128	10,128	2.16E+08	25,776	589,000	4.418	0.950
	9	3,376	3,376	3,376	5.99E+07	26,568	402,333	1.006	0.223
	10	0	0	0	0.00E+00	25,992	309,000	0.000	0.000
	11	0	0	0	0.00E+00	25,200	309,000	0.000	0.000
	12	0	0	0	0.00E+00	25,344	309,000	0.000	0.000
	13	0	0	0	0.00E+00	25,128	309,000	0.000	0.000
	14	0	0	0	0.00E+00	25,344	309,000	0.000	0.000
	15	1,266	633	0	2.46E+07	25,200	355,667	0.167	0.035
	16	2,321	1,266	0	4.76E+07	25,056	542,333	0.480	0.100
	17	0	0	0	0.00E+00	25,704	309,000	0.000	0.000
	18	0	0	0	0.00E+00	25,344	309,000	0.000	0.000
	19	0	0	0	1.06E+06	25,488	309,000	0.000	0.000
	20	6,752	1,688	1,477	7.90E+07	25,992	355,667	0.871	0.189
	21	10,128	9,917	9,706	1.97E+08	25,128	589,000	4.325	0.907
	22	10,128	10,128	10,128	1.84E+08	26,064	589,000	4.418	0.961
	23	10,128	9,495	10,128	1.52E+08	25,416	589,000	4.325	0.917
	24	10,128	9,495	10,128	1.87E+08	26,136	589,000	4.325	0.943
	25	10,128	9,495	10,128	2.15E+08	27,432	589,000	4.325	0.990
	26	10,128	9,706	10,128	2.16E+08	27,360	589,000	4.356	0.995
	27	10,128	10,128	9,495	2.16E+08	26,856	589,000	4.325	0.969
	28	10,128	10,128	10,128	2.16E+08	27,432	589,000	4.418	1.011
	29	10,128	10,128	9,917	2.16E+08	27,216	589,000	4.387	0.996
	30	10,128	10,128	10,128	2.16E+08	27,504	589,000	4.418	1.014
	31	10,128	10,128	10,128	2.16E+08	27,936	589,000	4.418	1.030
AVERAGE		6,650	6,350	6,323	1.35E+08	26,389	494,161	2.771	0.622

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.72 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	38,700	91,154	4	4	4	48	48	48
2	38,400	91,136	4	4	4	48	48	48
3	38,400	91,154	4	4	4	48	48	48
4	37,800	91,145	4	4	4	48	48	48
5	38,900	91,164	4	4	4	48	48	48
6	37,900	91,173	4	4	4	48	48	48
7	37,900	91,164	4	4	4	48	48	48
8	38,000	91,154	4	4	4	48	48	48
9	37,200	91,145	4	4	4	48	48	48
10	38,000	91,154	4	4	4	48	48	48
11	37,700	91,182	4	4	4	48	48	48
12	37,000	91,136	4	4	4	48	48	48
13	36,900	91,145	4	4	4	48	48	48
14	37,000	91,154	4	4	4	48	48	48
15	36,900	91,173	4	4	4	48	48	48
16	36,900	91,164	4	4	4	48	48	48
17	36,000	91,145	4	4	4	48	48	48
18	37,400	91,136	4	4	4	48	48	48
19	37,600	91,182	4	4	4	48	48	48
20	38,300	91,164	4	4	4	48	48	48
21	38,100	90,863	4	4	4	48	48	48
22	38,400	91,127	4	4	4	48	48	48
23	38,700	91,154	4	4	4	48	48	48
24	38,600	91,145	4	4	4	48	48	48
25	38,700	91,145	4	4	4	48	48	48
26	39,000	91,173	4	4	4	48	48	48
27	39,400	91,127	4	4	4	48	48	48
28	38,700	89,048	4	4	4	45	48	48
29	38,100	90,790	4	4	4	45	48	48
30	37,100	91,145	4	4	4	45	48	48
AVERAGE	37,923	91,061	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
SEPTEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.16E+08	28,638	589,000	4.418	1.056
2	10,128	10,128	10,128	2.16E+08	28,416	589,000	4.418	1.048
3	10,128	10,128	10,128	2.16E+08	28,416	589,000	4.418	1.048
4	10,128	10,128	10,128	2.16E+08	27,972	589,000	4.418	1.031
5	10,128	10,128	10,128	2.16E+08	28,786	589,000	4.418	1.061
6	10,128	10,128	10,128	2.16E+08	28,046	589,000	4.418	1.034
7	10,128	10,128	10,128	2.16E+08	28,046	589,000	4.418	1.034
8	10,128	10,128	10,128	2.16E+08	28,120	589,000	4.418	1.037
9	10,128	10,128	10,128	2.16E+08	27,528	589,000	4.418	1.015
10	10,128	10,128	10,128	2.16E+08	28,120	589,000	4.418	1.037
11	10,128	10,128	10,128	2.16E+08	27,898	589,000	4.418	1.028
12	10,128	10,128	10,128	2.16E+08	27,380	589,000	4.418	1.009
13	10,128	10,128	10,128	2.16E+08	27,306	589,000	4.418	1.007
14	10,128	10,128	10,128	2.16E+08	27,380	589,000	4.418	1.009
15	10,128	10,128	10,128	2.16E+08	27,306	589,000	4.418	1.007
16	10,128	10,128	10,128	2.16E+08	27,306	589,000	4.418	1.007
17	10,128	10,128	10,128	2.16E+08	26,640	589,000	4.418	0.982
18	10,128	10,128	10,128	2.16E+08	27,676	589,000	4.418	1.020
19	10,128	10,128	10,128	2.16E+08	27,824	589,000	4.418	1.026
20	10,128	10,128	10,128	2.16E+08	28,342	589,000	4.418	1.045
21	10,128	10,128	10,128	2.15E+08	28,194	589,000	4.418	1.039
22	10,128	10,128	10,128	2.16E+08	28,416	589,000	4.418	1.048
23	10,128	10,128	10,128	2.16E+08	28,638	589,000	4.418	1.056
24	10,128	10,128	10,128	2.16E+08	28,564	589,000	4.418	1.053
25	10,128	10,128	10,128	2.16E+08	28,638	589,000	4.418	1.056
26	10,128	10,128	10,128	2.16E+08	28,860	589,000	4.418	1.064
27	10,128	10,128	10,128	2.16E+08	29,156	589,000	4.418	1.075
28	9,495	10,128	10,128	2.11E+08	28,638	589,000	4.325	1.034
29	9,495	10,128	10,128	2.15E+08	28,194	589,000	4.325	1.018
30	9,495	10,128	10,128	2.16E+08	27,454	589,000	4.325	0.991
AVERAGE	10,065	10,128	10,128	2.16E+08	28,063	589,000	4.408	1.032

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

OCTOBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	36,600	91,164	4	4	4	45	48	48
2	36,600	91,145	4	4	4	45	48	48
3	36,100	91,154	4	4	4	45	48	48
4	37,200	91,100	4	4	4	45	48	48
5	37,600	91,145	4	4	4	45	48	48
6	37,200	91,063	4	4	4	45	48	48
7	36,500	91,054	4	4	4	45	46	45
8	37,000	88,884	4	4	4	45	45	45
9	36,700	88,984	4	4	4	45	45	45
10	38,400	91,173	4	4	4	45	45	45
11	38,700	91,173	4	4	4	45	45	45
12	39,400	91,173	4	4	4	45	45	45
13	38,600	91,164	4	4	4	45	45	45
14	38,400	91,072	4	4	4	45	45	45
15	38,100	91,154	4	4	4	45	45	45
16	39,800	89,349	4	4	4	45	45	42
17	39,100	2,845	4	2	2	15	15	13
18	41,000	0	2	0	0	0	0	0
19	40,800	0	0	0	0	0	0	0
20	36,600	0	0	0	0	0	0	0
21	37,900	0	0	0	0	0	0	0
22	38,800	0	0	0	0	0	0	0
23	36,700	0	0	0	0	0	0	0
24	37,400	0	0	0	0	0	0	0
25	36,700	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
AVERAGE	30,577	46,929	2	2	2	24	24	24

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
OCTOBER	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	9,495	10,128	10,128	2.16E+08	28,548	589,000	4.325	1.030
	2	9,495	10,128	10,128	2.16E+08	28,548	589,000	4.325	1.030
	3	9,495	10,128	10,128	2.16E+08	28,158	589,000	4.325	1.016
	4	9,495	10,128	10,128	2.16E+08	29,016	589,000	4.325	1.047
	5	9,495	10,128	10,128	2.16E+08	29,328	589,000	4.325	1.059
	6	9,495	10,128	10,128	2.16E+08	29,016	589,000	4.325	1.047
	7	9,495	9,706	9,495	2.16E+08	28,470	589,000	4.172	0.991
	8	9,495	9,495	9,495	2.11E+08	28,860	589,000	4.141	0.997
	9	9,495	9,495	9,495	2.11E+08	28,626	589,000	4.141	0.989
	10	9,495	9,495	9,495	2.16E+08	29,952	589,000	4.141	1.035
	11	9,495	9,495	9,495	2.16E+08	30,186	589,000	4.141	1.043
	12	9,495	9,495	9,495	2.16E+08	30,732	589,000	4.141	1.062
	13	9,495	9,495	9,495	2.16E+08	30,108	589,000	4.141	1.041
	14	9,495	9,495	9,495	2.16E+08	29,952	589,000	4.141	1.035
	15	9,495	9,495	9,495	2.16E+08	29,718	589,000	4.141	1.027
	16	9,495	9,495	8,862	2.12E+08	31,044	589,000	4.049	1.049
	17	3,165	3,165	2,743	6.74E+06	30,498	402,333	0.901	0.229
	18	0	0	0	0.00E+00	31,980	122,333	0.000	0.000
	19	0	0	0	0.00E+00	31,824	29,000	0.000	0.000
	20	0	0	0	0.00E+00	28,548	29,000	0.000	0.000
	21	0	0	0	0.00E+00	29,562	29,000	0.000	0.000
	22	0	0	0	0.00E+00	30,264	29,000	0.000	0.000
	23	0	0	0	0.00E+00	28,626	29,000	0.000	0.000
	24	0	0	0	0.00E+00	29,172	29,000	0.000	0.000
	25	0	0	0	0.00E+00	28,626	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		5,003	5,132	5,091	1.11E+08	23,850	333,086	2.200	0.540

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
AVERAGE	0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
NOVEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	0	0	0	0.00E+00	0	29,000	0.000	0.000
2	0	0	0	0.00E+00	0	29,000	0.000	0.000
3	0	0	0	0.00E+00	0	29,000	0.000	0.000
4	0	0	0	0.00E+00	0	29,000	0.000	0.000
5	0	0	0	0.00E+00	0	29,000	0.000	0.000
6	0	0	0	0.00E+00	0	29,000	0.000	0.000
7	0	0	0	0.00E+00	0	29,000	0.000	0.000
8	0	0	0	0.00E+00	0	29,000	0.000	0.000
9	0	0	0	0.00E+00	0	29,000	0.000	0.000
10	0	0	0	0.00E+00	0	29,000	0.000	0.000
11	0	0	0	0.00E+00	0	29,000	0.000	0.000
12	0	0	0	0.00E+00	0	29,000	0.000	0.000
13	0	0	0	0.00E+00	0	29,000	0.000	0.000
14	0	0	0	0.00E+00	0	29,000	0.000	0.000
15	0	0	0	0.00E+00	0	29,000	0.000	0.000
16	0	0	0	0.00E+00	0	29,000	0.000	0.000
17	0	0	0	0.00E+00	0	29,000	0.000	0.000
18	0	0	0	0.00E+00	0	29,000	0.000	0.000
19	0	0	0	0.00E+00	0	29,000	0.000	0.000
20	0	0	0	0.00E+00	0	29,000	0.000	0.000
21	0	0	0	0.00E+00	0	29,000	0.000	0.000
22	0	0	0	0.00E+00	0	29,000	0.000	0.000
23	0	0	0	0.00E+00	0	29,000	0.000	0.000
24	0	0	0	0.00E+00	0	29,000	0.000	0.000
25	0	0	0	0.00E+00	0	29,000	0.000	0.000
26	0	0	0	0.00E+00	0	29,000	0.000	0.000
27	0	0	0	0.00E+00	0	29,000	0.000	0.000
28	0	0	0	0.00E+00	0	29,000	0.000	0.000
29	0	0	0	0.00E+00	0	29,000	0.000	0.000
30	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE	0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 2

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
AVERAGE	0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

DECEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	0	0	0	0.00E+00	0	29,000	0.000	0.000
2	0	0	0	0.00E+00	0	29,000	0.000	0.000
3	0	0	0	0.00E+00	0	29,000	0.000	0.000
4	0	0	0	0.00E+00	0	29,000	0.000	0.000
5	0	0	0	0.00E+00	0	29,000	0.000	0.000
6	0	0	0	0.00E+00	0	29,000	0.000	0.000
7	0	0	0	0.00E+00	0	29,000	0.000	0.000
8	0	0	0	0.00E+00	0	29,000	0.000	0.000
9	0	0	0	0.00E+00	0	29,000	0.000	0.000
10	0	0	0	0.00E+00	0	29,000	0.000	0.000
11	0	0	0	0.00E+00	0	29,000	0.000	0.000
12	0	0	0	0.00E+00	0	29,000	0.000	0.000
13	0	0	0	0.00E+00	0	29,000	0.000	0.000
14	0	0	0	0.00E+00	0	29,000	0.000	0.000
15	0	0	0	0.00E+00	0	29,000	0.000	0.000
16	0	0	0	0.00E+00	0	29,000	0.000	0.000
17	0	0	0	0.00E+00	0	29,000	0.000	0.000
18	0	0	0	0.00E+00	0	29,000	0.000	0.000
19	0	0	0	0.00E+00	0	29,000	0.000	0.000
20	0	0	0	0.00E+00	0	29,000	0.000	0.000
21	0	0	0	0.00E+00	0	29,000	0.000	0.000
22	0	0	0	0.00E+00	0	29,000	0.000	0.000
23	0	0	0	0.00E+00	0	29,000	0.000	0.000
24	0	0	0	0.00E+00	0	29,000	0.000	0.000
25	0	0	0	0.00E+00	0	29,000	0.000	0.000
26	0	0	0	0.00E+00	0	29,000	0.000	0.000
27	0	0	0	0.00E+00	0	29,000	0.000	0.000
28	0	0	0	0.00E+00	0	29,000	0.000	0.000
29	0	0	0	0.00E+00	0	29,000	0.000	0.000
30	0	0	0	0.00E+00	0	29,000	0.000	0.000
31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE	0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

JANUARY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	17,600	90,945	4	4	4	48	42	39
	2	18,700	90,954	4	4	4	48	48	45
	3	18,600	90,936	4	4	4	48	48	45
	4	19,000	90,954	4	4	4	48	48	45
	5	18,500	90,963	4	4	4	48	48	45
	6	18,000	90,945	4	4	4	48	48	45
	7	17,800	90,881	4	4	4	48	48	45
	8	18,100	90,899	4	4	4	48	46	45
	9	16,000	90,799	4	4	4	48	46	45
	10	17,200	90,890	4	4	4	48	48	43
	11	15,800	90,945	4	4	4	48	48	44
	12	15,600	90,954	4	4	4	48	48	45
	13	15,000	90,963	4	4	4	48	48	45
	14	15,200	90,899	4	4	4	48	48	45
	15	15,100	90,945	4	4	4	48	48	45
	16	14,800	90,917	4	4	4	48	48	45
	17	14,900	90,908	4	4	4	48	48	45
	18	14,500	90,863	4	4	4	48	48	45
	19	14,500	90,890	4	4	4	48	48	45
	20	19,400	90,881	4	4	4	48	48	45
	21	14,200	90,917	4	4	4	48	48	45
	22	14,500	90,872	4	4	4	48	45	45
	23	14,400	90,908	4	4	4	48	45	45
	24	14,400	90,908	4	4	4	48	45	45
	25	14,300	87,005	4	4	4	48	35	23
	26	14,800	91,018	4	4	4	48	45	45
	27	16,100	90,963	4	4	4	48	45	45
	28	14,800	90,908	4	4	4	48	45	45
	29	15,300	90,917	4	4	4	48	45	45
	30	14,900	90,945	4	4	4	48	45	45
	31	14,200	90,908	4	4	4	42	39	45
AVERAGE		16,006	90,793	4	4	4	48	46	44

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JANUARY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	8,862	8,229	2.16E+08	13,024	589,000	1.055	0.115
	2	10,128	10,128	9,495	2.16E+08	13,838	589,000	1.153	0.133
	3	10,128	10,128	9,495	2.16E+08	13,764	589,000	1.153	0.132
	4	10,128	10,128	9,495	2.16E+08	14,060	589,000	1.153	0.135
	5	10,128	10,128	9,495	2.16E+08	13,690	589,000	1.153	0.132
	6	10,128	10,128	9,495	2.16E+08	13,320	589,000	1.153	0.128
	7	10,128	10,128	9,495	2.15E+08	13,172	589,000	1.153	0.127
	8	10,128	9,706	9,495	2.15E+08	13,394	589,000	1.137	0.127
	9	10,128	9,706	9,495	2.15E+08	11,840	589,000	1.137	0.112
	10	10,128	10,128	9,073	2.15E+08	12,728	589,000	1.137	0.121
	11	10,128	10,128	9,284	2.16E+08	11,692	589,000	1.145	0.112
	12	10,128	10,128	9,495	2.16E+08	11,544	589,000	1.153	0.111
	13	10,128	10,128	9,495	2.16E+08	11,100	589,000	1.153	0.107
	14	10,128	10,128	9,495	2.15E+08	11,248	589,000	1.153	0.108
	15	10,128	10,128	9,495	2.16E+08	11,174	589,000	1.153	0.108
	16	10,128	10,128	9,495	2.15E+08	10,952	589,000	1.153	0.105
	17	10,128	10,128	9,495	2.15E+08	11,026	589,000	1.153	0.106
	18	10,128	10,128	9,495	2.15E+08	10,730	589,000	1.153	0.103
	19	10,128	10,128	9,495	2.15E+08	10,730	589,000	1.153	0.103
	20	10,128	10,128	9,495	2.15E+08	14,356	589,000	1.153	0.138
	21	10,128	10,128	9,495	2.15E+08	10,508	589,000	1.153	0.101
	22	10,128	9,495	9,495	2.15E+08	10,730	589,000	1.129	0.101
	23	10,128	9,495	9,495	2.15E+08	10,656	589,000	1.129	0.100
	24	10,128	9,495	9,495	2.15E+08	10,656	589,000	1.129	0.100
	25	10,128	7,385	4,853	2.06E+08	10,582	589,000	0.867	0.077
	26	10,128	9,495	9,495	2.16E+08	10,952	589,000	1.129	0.103
	27	10,128	9,495	9,495	2.16E+08	11,914	589,000	1.129	0.112
	28	10,128	9,495	9,495	2.15E+08	10,952	589,000	1.129	0.103
	29	10,128	9,495	9,495	2.15E+08	11,322	589,000	1.129	0.107
	30	10,128	9,495	9,495	2.16E+08	11,026	589,000	1.129	0.104
	31	8,862	8,229	9,495	2.15E+08	10,508	589,000	1.031	0.090
AVERAGE		10,087	9,747	9,284	2.15E+08	11,845	589,000	1.129	0.112

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	14,400	90,890	4	4	4	48	43	45
2	15,100	90,899	4	4	4	48	42	45
3	16,200	90,908	4	4	4	48	42	45
4	16,600	90,899	4	4	4	48	36	45
5	16,300	90,917	4	4	4	48	33	45
6	16,700	90,945	4	4	4	48	33	45
7	18,100	90,908	4	4	4	48	33	45
8	17,100	90,926	4	4	4	48	33	45
9	17,100	90,908	4	4	4	48	37	45
10	17,400	90,917	4	4	4	48	39	45
11	17,900	90,817	4	4	4	48	39	45
12	18,500	90,826	4	4	4	48	39	45
13	18,100	90,926	4	4	4	48	38	45
14	17,900	91,145	4	4	4	48	42	45
15	18,700	91,100	4	4	4	48	43	45
16	19,500	91,091	4	4	4	48	48	45
17	19,300	91,136	4	4	4	48	48	45
18	19,600	91,191	4	4	4	48	36	45
19	18,800	91,081	4	4	4	48	32	45
20	17,900	91,100	4	4	4	48	43	45
21	18,100	91,063	4	4	4	48	43	45
22	17,900	91,054	4	4	4	48	43	45
23	18,700	91,077	4	4	4	48	48	45
24	18,300	91,072	4	4	4	48	48	45
25	17,700	91,091	4	4	4	48	38	45
26	18,300	91,081	4	4	4	48	33	45
27	18,900	91,063	4	4	4	48	34	45
28	19,800	91,091	4	4	4	48	40	45
AVERAGE	17,818	91,004	4	4	4	48	40	45

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

FEBRUARY DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	9,073	9,495	2.15E+08	11,376	589,000	1.113	0.106
2	10,128	8,862	9,495	2.15E+08	11,929	589,000	1.104	0.110
3	10,128	8,862	9,495	2.15E+08	12,798	589,000	1.104	0.118
4	10,128	7,596	9,495	2.15E+08	13,114	589,000	1.055	0.115
5	10,128	6,963	9,495	2.15E+08	12,877	589,000	1.031	0.111
6	10,128	6,963	9,495	2.16E+08	13,193	589,000	1.031	0.113
7	10,128	6,963	9,495	2.15E+08	14,299	589,000	1.031	0.123
8	10,128	6,963	9,495	2.15E+08	13,509	589,000	1.031	0.116
9	10,128	7,807	9,495	2.15E+08	13,509	589,000	1.063	0.120
10	10,128	8,229	9,495	2.15E+08	13,746	589,000	1.080	0.124
11	10,128	8,229	9,495	2.15E+08	14,141	589,000	1.080	0.127
12	10,128	8,229	9,495	2.15E+08	14,615	589,000	1.080	0.132
13	10,128	8,018	9,495	2.15E+08	14,299	589,000	1.072	0.128
14	10,128	8,862	9,495	2.16E+08	14,141	589,000	1.104	0.130
15	10,128	9,073	9,495	2.16E+08	14,773	589,000	1.113	0.137
16	10,128	10,128	9,495	2.16E+08	15,405	589,000	1.153	0.148
17	10,128	10,128	9,495	2.16E+08	15,247	589,000	1.153	0.147
18	10,128	7,596	9,495	2.16E+08	15,484	589,000	1.055	0.136
19	10,128	6,752	9,495	2.16E+08	14,852	589,000	1.023	0.127
20	10,128	9,073	9,495	2.16E+08	14,141	589,000	1.113	0.131
21	10,128	9,073	9,495	2.16E+08	14,299	589,000	1.113	0.133
22	10,128	9,073	9,495	2.16E+08	14,141	589,000	1.113	0.131
23	10,128	10,128	9,495	2.16E+08	14,773	589,000	1.153	0.142
24	10,128	10,128	9,495	2.16E+08	14,457	589,000	1.153	0.139
25	10,128	8,018	9,495	2.16E+08	13,983	589,000	1.072	0.125
26	10,128	6,963	9,495	2.16E+08	14,457	589,000	1.031	0.124
27	10,128	7,174	9,495	2.16E+08	14,931	589,000	1.039	0.129
28	10,128	8,440	9,495	2.16E+08	15,642	589,000	1.088	0.142
AVERAGE	10,128	8,335	9,495	2.16E+08	14,076	589,000	1.084	0.127

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	19,900	91,100	4	4	4	48	44	45
	2	18,700	91,136	4	4	4	48	48	45
	3	19,600	91,118	4	4	4	48	48	42
	4	19,700	91,091	4	4	4	48	48	34
	5	21,700	71,574	4	4	4	48	48	26
	6	20,300	64,150	4	4	4	48	40	22
	7	18,800	64,214	4	4	4	48	44	8
	8	18,900	63,986	4	4	4	48	39	4
	9	18,500	63,913	4	4	4	48	42	3
	10	20,100	63,949	4	4	4	48	48	14
	11	20,200	63,977	4	4	4	48	48	10
	12	19,300	64,059	4	4	4	48	34	2
	13	20,300	63,913	4	4	4	47	38	6
	14	21,400	64,111	4	4	4	48	48	0
	15	22,100	60,785	4	4	4	48	48	0
	16	20,700	903	4	2	2	16	16	0
	17	22,200	0	2	2	2	0	0	0
	18	19,700	0	0	0	0	0	0	0
	19	20,300	0	0	0	0	0	0	0
	20	19,100	0	0	0	0	0	0	0
	21	18,400	0	0	0	0	0	0	0
	22	18,700	0	0	0	0	0	0	0
	23	16,500	0	0	0	0	0	0	0
	24	16,100	0	0	0	0	0	0	0
	25	15,700	0	0	0	0	0	0	0
	26	15,400	0	0	0	0	0	0	0
	27	14,400	0	0	0	0	0	0	0
	28	13,700	0	0	0	0	0	0	0
	29	14,500	0	0	0	0	0	0	0
	30	14,200	0	0	0	0	0	0	0
	31	16,100	0	0	0	0	0	0	0
AVERAGE		18,555	34,644	2	2	2	24	22	8

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.90 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

MARCH	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	9,284	9,495	2.16E+08	17,910	589,000	1.121	0.168
	2	10,128	10,128	9,495	2.16E+08	16,830	589,000	1.153	0.162
	3	10,128	10,128	8,862	2.16E+08	17,640	589,000	1.129	0.166
	4	10,128	10,128	7,174	2.16E+08	17,730	589,000	1.063	0.157
	5	10,128	10,128	5,486	1.70E+08	19,530	589,000	0.998	0.163
	6	10,128	8,440	4,642	1.52E+08	18,270	589,000	0.900	0.137
	7	10,128	9,284	1,688	1.52E+08	16,920	589,000	0.818	0.116
	8	10,128	8,229	844	1.52E+08	17,010	589,000	0.744	0.106
	9	10,128	8,862	633	1.51E+08	16,650	589,000	0.761	0.106
	10	10,128	10,128	2,954	1.52E+08	18,090	589,000	0.900	0.136
	11	10,128	10,128	2,110	1.52E+08	18,180	589,000	0.867	0.132
	12	10,128	7,174	422	1.52E+08	17,370	589,000	0.687	0.100
	13	9,917	8,018	1,266	1.51E+08	18,270	589,000	0.744	0.113
	14	10,128	10,128	0	1.52E+08	19,260	589,000	0.785	0.126
	15	10,128	10,128	0	1.44E+08	19,890	589,000	0.785	0.130
	16	3,376	3,376	0	2.14E+06	18,630	402,333	0.179	0.028
	17	0	0	0	0.00E+00	19,980	309,000	0.000	0.000
	18	0	0	0	0.00E+00	17,730	29,000	0.000	0.000
	19	0	0	0	0.00E+00	18,270	29,000	0.000	0.000
	20	0	0	0	0.00E+00	17,190	29,000	0.000	0.000
	21	0	0	0	0.00E+00	16,560	29,000	0.000	0.000
	22	0	0	0	0.00E+00	16,830	29,000	0.000	0.000
	23	0	0	0	0.00E+00	14,850	29,000	0.000	0.000
	24	0	0	0	0.00E+00	14,490	29,000	0.000	0.000
	25	0	0	0	0.00E+00	14,130	29,000	0.000	0.000
	26	0	0	0	0.00E+00	13,860	29,000	0.000	0.000
	27	0	0	0	0.00E+00	12,960	29,000	0.000	0.000
	28	0	0	0	0.00E+00	12,330	29,000	0.000	0.000
	29	0	0	0	0.00E+00	13,050	29,000	0.000	0.000
	30	0	0	0	0.00E+00	12,780	29,000	0.000	0.000
	31	0	0	0	0.00E+00	14,490	29,000	0.000	0.000
AVERAGE		5,003	4,635	1,776	8.21E+07	16,699	321,043	0.440	0.066

ASSUMPTIONS: Drift Rate = 0.0002%

TDS ppm = 0.90 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	16,800	0	0	0	0	0	0	0
	2	16,900	0	0	0	0	0	0	0
	3	17,900	0	0	0	0	0	0	0
	4	19,000	0	0	0	0	0	0	0
	5	19,900	0	0	0	0	0	0	0
	6	21,400	0	0	0	0	0	0	0
	7	17,400	0	0	0	0	0	0	0
	8	18,200	0	0	0	0	0	0	0
	9	18,400	0	0	0	0	0	0	0
	10	18,600	0	0	0	0	0	0	0
	11	16,100	0	0	0	0	0	0	0
	12	16,100	0	0	0	0	0	0	0
	13	16,100	0	0	0	0	0	0	0
	14	15,800	0	0	0	0	0	0	0
	15	17,000	0	0	0	0	0	0	0
	16	18,000	0	0	0	0	0	0	0
	17	14,000	0	0	0	0	0	0	0
	18	12,500	0	0	0	0	0	0	0
	19	13,000	0	0	0	0	0	0	0
	20	13,500	0	0	0	0	0	0	0
	21	13,900	0	0	0	0	0	0	0
	22	15,000	0	0	0	0	0	0	0
	23	15,200	0	0	0	0	0	0	0
	24	15,600	0	0	0	0	0	0	0
	25	10,030	0	0	0	0	0	0	0
	26	11,200	0	0	0	0	0	0	0
	27	11,700	0	0	0	0	0	0	0
	28	13,000	0	0	0	0	0	0	0
	29	15,500	0	0	0	0	0	0	0
	30	15,200	0	0	0	0	0	0	0
AVERAGE		15,764	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

APRIL	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	0	0	0	0.00E+00	13,944	29,000	0.000	0.000
	2	0	0	0	0.00E+00	14,027	29,000	0.000	0.000
	3	0	0	0	0.00E+00	14,857	29,000	0.000	0.000
	4	0	0	0	0.00E+00	15,770	29,000	0.000	0.000
	5	0	0	0	0.00E+00	16,517	29,000	0.000	0.000
	6	0	0	0	0.00E+00	17,762	29,000	0.000	0.000
	7	0	0	0	0.00E+00	14,442	29,000	0.000	0.000
	8	0	0	0	0.00E+00	15,106	29,000	0.000	0.000
	9	0	0	0	0.00E+00	15,272	29,000	0.000	0.000
	10	0	0	0	0.00E+00	15,438	29,000	0.000	0.000
	11	0	0	0	0.00E+00	13,363	29,000	0.000	0.000
	12	0	0	0	0.00E+00	13,363	29,000	0.000	0.000
	13	0	0	0	0.00E+00	13,363	29,000	0.000	0.000
	14	0	0	0	0.00E+00	13,114	29,000	0.000	0.000
	15	0	0	0	0.00E+00	14,110	29,000	0.000	0.000
	16	0	0	0	0.00E+00	14,940	29,000	0.000	0.000
	17	0	0	0	0.00E+00	11,620	29,000	0.000	0.000
	18	0	0	0	0.00E+00	10,375	29,000	0.000	0.000
	19	0	0	0	0.00E+00	10,790	29,000	0.000	0.000
	20	0	0	0	0.00E+00	11,205	29,000	0.000	0.000
	21	0	0	0	0.00E+00	11,537	29,000	0.000	0.000
	22	0	0	0	0.00E+00	12,450	29,000	0.000	0.000
	23	0	0	0	0.00E+00	12,616	29,000	0.000	0.000
	24	0	0	0	0.00E+00	12,948	29,000	0.000	0.000
	25	0	0	0	0.00E+00	8,325	29,000	0.000	0.000
	26	0	0	0	0.00E+00	9,296	29,000	0.000	0.000
	27	0	0	0	0.00E+00	9,711	29,000	0.000	0.000
	28	0	0	0	0.00E+00	10,790	29,000	0.000	0.000
	29	0	0	0	0.00E+00	12,865	29,000	0.000	0.000
	30	0	0	0	0.00E+00	12,616	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	13,084	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	16,100	0	0	0	0	0	0	0
	2	15,800	0	0	0	0	0	0	0
	3	16,100	0	0	0	0	0	0	0
	4	16,400	0	0	0	0	0	0	0
	5	17,000	0	0	0	0	0	0	0
	6	18,200	0	0	0	0	0	0	0
	7	18,600	0	0	0	0	0	0	0
	8	19,500	0	0	0	0	0	0	0
	9	19,400	0	0	0	0	0	0	0
	10	18,800	0	0	0	0	0	0	0
	11	18,900	0	0	0	0	0	0	0
	12	19,300	0	0	0	0	0	0	0
	13	20,100	0	0	0	0	0	0	0
	14	20,700	0	0	0	0	0	0	0
	15	19,700	0	0	0	0	0	0	0
	16	20,100	0	0	0	0	0	0	0
	17	15,300	0	0	0	0	0	0	0
	18	13,300	0	0	0	0	0	0	0
	19	9,400	0	0	0	0	0	0	0
	20	6,880	0	0	0	0	0	0	0
	21	5,580	0	0	0	0	0	0	0
	22	3,740	0	0	0	0	0	0	0
	23	3,740	0	0	0	0	0	0	0
	24	3,210	0	2	2	2	0	0	0
	25	3,480	0	2	2	2	0	0	0
	26	3,730	0	2	2	2	0	0	0
	27	3,790	0	2	2	2	0	0	0
	28	4,030	0	2	2	2	0	0	0
	29	3,690	0	2	2	2	0	0	0
	30	3,510	0	2	2	2	0	0	0
	31	3,610	0	2	2	2	0	0	0
AVERAGE		12,313	0	1	1	1	0	0	0

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MAY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	13,363	29,000	0.000	0.000
	2	0	0	0	0.00E+00	13,114	29,000	0.000	0.000
	3	0	0	0	0.00E+00	13,363	29,000	0.000	0.000
	4	0	0	0	0.00E+00	13,612	29,000	0.000	0.000
	5	0	0	0	0.00E+00	14,110	29,000	0.000	0.000
	6	0	0	0	0.00E+00	15,106	29,000	0.000	0.000
	7	0	0	0	0.00E+00	15,438	29,000	0.000	0.000
	8	0	0	0	0.00E+00	16,185	29,000	0.000	0.000
	9	0	0	0	0.00E+00	16,102	29,000	0.000	0.000
	10	0	0	0	0.00E+00	15,604	29,000	0.000	0.000
	11	0	0	0	0.00E+00	15,687	29,000	0.000	0.000
	12	0	0	0	0.00E+00	16,019	29,000	0.000	0.000
	13	0	0	0	0.00E+00	16,683	29,000	0.000	0.000
	14	0	0	0	0.00E+00	17,181	29,000	0.000	0.000
	15	0	0	0	0.00E+00	16,351	29,000	0.000	0.000
	16	0	0	0	0.00E+00	16,683	29,000	0.000	0.000
	17	0	0	0	0.00E+00	12,699	29,000	0.000	0.000
	18	0	0	0	0.00E+00	11,039	29,000	0.000	0.000
	19	0	0	0	0.00E+00	7,802	29,000	0.000	0.000
	20	0	0	0	0.00E+00	5,710	29,000	0.000	0.000
	21	0	0	0	0.00E+00	4,631	29,000	0.000	0.000
	22	0	0	0	0.00E+00	3,104	29,000	0.000	0.000
	23	0	0	0	0.00E+00	3,104	29,000	0.000	0.000
	24	0	0	0	0.00E+00	2,664	309,000	0.000	0.000
	25	0	0	0	0.00E+00	2,888	309,000	0.000	0.000
	26	0	0	0	0.00E+00	3,096	309,000	0.000	0.000
	27	0	0	0	0.00E+00	3,146	309,000	0.000	0.000
	28	0	0	0	0.00E+00	3,345	309,000	0.000	0.000
	29	0	0	0	0.00E+00	3,063	309,000	0.000	0.000
	30	0	0	0	0.00E+00	2,913	309,000	0.000	0.000
	31	0	0	0	0.00E+00	2,996	309,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	10,219	101,258	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	3,980	0	2	2	2	0	0	0
	2	4,000	2,161	2	2	3	0	0	0
	3	4,250	10,278	4	4	4	0	0	29
	4	5,750	17,574	4	4	4	2	0	33
	5	7,050	31,783	4	4	4	7	7	37
	6	8,030	59,289	4	4	4	22	42	43
	7	10,850	62,983	4	4	4	28	48	47
	8	13,700	63,348	4	4	4	42	48	48
	9	16,400	68,528	4	4	4	45	48	48
	10	18,200	88,692	4	4	4	42	48	48
	11	21,500	90,315	4	4	4	42	46	48
	12	23,500	90,060	4	4	4	42	45	48
	13	24,800	90,963	4	4	4	42	46	48
	14	26,800	91,063	4	4	4	43	47	48
	15	26,600	91,118	4	4	4	45	48	48
	16	28,300	91,109	4	4	4	45	48	48
	17	29,100	91,091	4	4	4	45	46	48
	18	28,800	91,091	4	4	4	45	46	46
	19	29,300	41,770	4	4	3	38	39	40
	20	29,000	0	2	2	2	0	0	0
	21	26,000	0	2	2	2	0	0	0
	22	24,700	648	2	2	3	0	7	0
	23	25,600	50,589	4	4	4	8	40	8
	24	24,800	90,954	4	4	4	45	47	48
	25	27,000	91,063	4	4	4	47	48	48
	26	27,400	90,799	4	4	4	47	48	45
	27	28,700	91,091	4	4	4	48	48	45
	28	27,700	91,118	4	4	4	48	48	45
	29	29,400	91,091	4	4	4	48	48	45
	30	30,900	91,127	4	4	4	48	48	45
AVERAGE		21,070	62,056	4	4	4	30	34	36

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.76 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JUNE	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	3,025	309,000	0.000	0.000
	2	0	0	0	5.12E+06	3,040	355,667	0.000	0.000
	3	0	0	6,119	2.44E+07	3,230	589,000	0.237	0.006
	4	422	0	6,963	4.17E+07	4,370	589,000	0.286	0.010
	5	1,477	1,477	7,807	7.53E+07	5,358	589,000	0.417	0.019
	6	4,642	8,862	9,073	1.41E+08	6,103	589,000	0.875	0.045
	7	5,908	10,128	9,917	1.49E+08	8,246	589,000	1.006	0.069
	8	8,862	10,128	10,128	1.50E+08	10,412	589,000	1.129	0.098
	9	9,495	10,128	10,128	1.62E+08	12,464	589,000	1.153	0.120
	10	8,862	10,128	10,128	2.10E+08	13,832	589,000	1.129	0.130
	11	8,862	9,706	10,128	2.14E+08	16,340	589,000	1.113	0.152
	12	8,862	9,495	10,128	2.13E+08	17,860	589,000	1.104	0.165
	13	8,862	9,706	10,128	2.16E+08	18,848	589,000	1.113	0.175
	14	9,073	9,917	10,128	2.16E+08	20,368	589,000	1.129	0.192
	15	9,495	10,128	10,128	2.16E+08	20,216	589,000	1.153	0.195
	16	9,495	10,128	10,128	2.16E+08	21,508	589,000	1.153	0.207
	17	9,495	9,706	10,128	2.16E+08	22,116	589,000	1.137	0.210
	18	9,495	9,706	9,706	2.16E+08	21,888	589,000	1.121	0.205
	19	8,018	8,229	8,440	9.90E+07	22,268	542,333	0.881	0.164
	20	0	0	0	0.00E+00	22,040	309,000	0.000	0.000
	21	0	0	0	0.00E+00	19,760	309,000	0.000	0.000
	22	0	1,477	0	1.53E+06	18,772	355,667	0.035	0.005
	23	1,688	8,440	1,688	1.20E+08	19,456	589,000	0.458	0.074
	24	9,495	9,917	10,128	2.16E+08	18,848	589,000	1.145	0.180
	25	9,917	10,128	10,128	2.16E+08	20,520	589,000	1.170	0.200
	26	9,917	10,128	9,495	2.15E+08	20,824	589,000	1.145	0.199
	27	10,128	10,128	9,495	2.16E+08	21,812	589,000	1.153	0.210
	28	10,128	10,128	9,495	2.16E+08	21,052	589,000	1.153	0.203
	29	10,128	10,128	9,495	2.16E+08	22,344	589,000	1.153	0.215
	30	10,128	10,128	9,495	2.16E+08	23,484	589,000	1.153	0.226
AVERAGE		6,428	7,272	7,624	1.47E+08	16,013	543,889	0.823	0.122

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.76 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	30,700	91,118	4	4	4	48	48	45
	2	31,000	91,136	4	4	4	48	48	43
	3	31,000	91,154	4	4	4	48	48	46
	4	32,700	91,054	4	4	4	48	48	47
	5	32,100	84,761	4	4	4	48	48	48
	6	29,900	64,278	4	4	4	48	48	48
	7	28,700	73,772	4	4	4	48	48	48
	8	26,400	90,972	4	4	4	48	48	48
	9	26,400	91,118	4	4	4	48	48	48
	10	27,300	91,164	4	4	4	48	48	48
	11	27,100	91,054	4	4	4	48	48	48
	12	27,500	90,981	4	4	4	48	48	48
	13	28,000	91,145	4	4	4	48	48	48
	14	28,000	91,136	4	4	4	48	48	48
	15	28,300	91,091	4	4	4	48	48	48
	16	29,000	91,118	4	4	4	48	48	48
	17	29,800	91,145	4	4	4	48	48	48
	18	29,500	91,100	4	4	4	48	48	48
	19	29,700	91,100	4	4	4	48	48	48
	20	30,400	91,054	4	4	4	48	48	48
	21	30,600	90,981	4	4	4	48	48	48
	22	31,500	91,109	4	4	4	48	48	48
	23	30,800	91,091	4	4	4	48	48	48
	24	32,600	91,100	4	4	4	48	45	48
	25	33,000	91,127	4	4	4	48	45	48
	26	33,700	91,127	4	4	4	48	45	48
	27	34,800	91,063	4	4	4	48	45	48
	28	35,200	91,154	4	4	4	48	45	48
	29	37,000	91,127	4	4	4	48	45	48
	30	37,600	91,091	4	4	4	48	46	48
	31	37,600	91,091	4	4	4	48	47	48
AVERAGE		30,900	89,468	4	4	4	48	47	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JULY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	9,495	2.16E+08	22,718	589,000	1.153	0.219
	2	10,128	10,128	9,073	2.16E+08	22,940	589,000	1.137	0.218
	3	10,128	10,128	9,706	2.16E+08	22,940	589,000	1.162	0.222
	4	10,128	10,128	9,917	2.16E+08	24,198	589,000	1.170	0.236
	5	10,128	10,128	10,128	2.01E+08	23,754	589,000	1.178	0.234
	6	10,128	10,128	10,128	1.52E+08	22,126	589,000	1.178	0.218
	7	10,128	10,128	10,128	1.75E+08	21,238	589,000	1.178	0.209
	8	10,128	10,128	10,128	2.16E+08	19,536	589,000	1.178	0.192
	9	10,128	10,128	10,128	2.16E+08	19,536	589,000	1.178	0.192
	10	10,128	10,128	10,128	2.16E+08	20,202	589,000	1.178	0.199
	11	10,128	10,128	10,128	2.16E+08	20,054	589,000	1.178	0.197
	12	10,128	10,128	10,128	2.16E+08	20,350	589,000	1.178	0.200
	13	10,128	10,128	10,128	2.16E+08	20,720	589,000	1.178	0.204
	14	10,128	10,128	10,128	2.16E+08	20,720	589,000	1.178	0.204
	15	10,128	10,128	10,128	2.16E+08	20,942	589,000	1.178	0.206
	16	10,128	10,128	10,128	2.16E+08	21,460	589,000	1.178	0.211
	17	10,128	10,128	10,128	2.16E+08	22,052	589,000	1.178	0.217
	18	10,128	10,128	10,128	2.16E+08	21,830	589,000	1.178	0.215
	19	10,128	10,128	10,128	2.16E+08	21,978	589,000	1.178	0.216
	20	10,128	10,128	10,128	2.16E+08	22,496	589,000	1.178	0.221
	21	10,128	10,128	10,128	2.16E+08	22,644	589,000	1.178	0.223
	22	10,128	10,128	10,128	2.16E+08	23,310	589,000	1.178	0.229
	23	10,128	10,128	10,128	2.16E+08	22,792	589,000	1.178	0.224
	24	10,128	9,495	10,128	2.16E+08	24,124	589,000	1.153	0.232
	25	10,128	9,495	10,128	2.16E+08	24,420	589,000	1.153	0.235
	26	10,128	9,495	10,128	2.16E+08	24,938	589,000	1.153	0.240
	27	10,128	9,495	10,128	2.16E+08	25,752	589,000	1.153	0.248
	28	10,128	9,495	10,128	2.16E+08	26,048	589,000	1.153	0.251
	29	10,128	9,495	10,128	2.16E+08	27,380	589,000	1.153	0.264
	30	10,128	9,706	10,128	2.16E+08	27,824	589,000	1.162	0.270
	31	10,128	9,917	10,128	2.16E+08	27,824	589,000	1.170	0.272
AVERAGE		10,128	9,985	10,053	2.12E+08	22,866	589,000	1.170	0.223

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	37,100	91,109	4	4	4	48	48	48
	2	38,000	91,136	4	4	4	48	48	48
	3	38,900	91,127	4	4	4	48	48	48
	4	38,700	91,182	4	4	4	48	48	48
	5	38,300	91,127	4	4	4	48	48	48
	6	37,700	91,145	4	4	4	48	48	48
	7	37,200	91,100	4	4	4	48	48	48
	8	37,500	91,145	4	4	4	48	48	48
	9	38,500	91,081	4	4	4	48	48	48
	10	38,400	91,054	4	4	4	48	48	48
	11	37,600	91,118	4	4	4	48	48	48
	12	36,800	91,164	4	4	4	48	48	48
	13	36,800	91,182	4	4	4	48	48	48
	14	36,200	91,182	4	4	4	48	48	48
	15	35,400	91,091	4	4	4	48	48	48
	16	36,600	91,036	4	4	4	48	48	48
	17	35,300	91,091	4	4	4	48	48	48
	18	35,100	91,100	4	4	4	48	48	48
	19	35,300	91,164	4	4	4	48	48	48
	20	36,100	91,154	4	4	4	48	48	48
	21	35,600	91,136	4	4	4	48	48	48
	22	36,200	91,136	4	4	4	48	48	48
	23	35,200	91,173	4	4	4	48	48	48
	24	36,500	91,136	4	4	4	48	48	48
	25	37,600	91,154	4	4	4	48	48	48
	26	37,100	91,118	4	4	4	48	48	48
	27	36,200	91,072	4	4	4	48	48	48
	28	36,500	91,091	4	4	4	48	48	48
	29	36,500	87,242	4	4	4	48	48	48
	30	36,900	91,018	4	4	4	48	48	48
	31	36,800	3,374	4	4	3	16	16	16
AVERAGE		36,858	88,166	4	4	4	47	47	47

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.69 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1991

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

AUGUST	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	25,599	589,000	1.178	0.252
	2	10,128	10,128	10,128	2.16E+08	26,220	589,000	1.178	0.258
	3	10,128	10,128	10,128	2.16E+08	26,841	589,000	1.178	0.264
	4	10,128	10,128	10,128	2.16E+08	26,703	589,000	1.178	0.263
	5	10,128	10,128	10,128	2.16E+08	26,427	589,000	1.178	0.260
	6	10,128	10,128	10,128	2.16E+08	26,013	589,000	1.178	0.256
	7	10,128	10,128	10,128	2.16E+08	25,668	589,000	1.178	0.252
	8	10,128	10,128	10,128	2.16E+08	25,875	589,000	1.178	0.254
	9	10,128	10,128	10,128	2.16E+08	26,565	589,000	1.178	0.261
	10	10,128	10,128	10,128	2.16E+08	26,496	589,000	1.178	0.260
	11	10,128	10,128	10,128	2.16E+08	25,944	589,000	1.178	0.255
	12	10,128	10,128	10,128	2.16E+08	25,392	589,000	1.178	0.250
	13	10,128	10,128	10,128	2.16E+08	25,392	589,000	1.178	0.250
	14	10,128	10,128	10,128	2.16E+08	24,978	589,000	1.178	0.246
	15	10,128	10,128	10,128	2.16E+08	24,426	589,000	1.178	0.240
	16	10,128	10,128	10,128	2.16E+08	25,254	589,000	1.178	0.248
	17	10,128	10,128	10,128	2.16E+08	24,357	589,000	1.178	0.239
	18	10,128	10,128	10,128	2.16E+08	24,219	589,000	1.178	0.238
	19	10,128	10,128	10,128	2.16E+08	24,357	589,000	1.178	0.239
	20	10,128	10,128	10,128	2.16E+08	24,909	589,000	1.178	0.245
	21	10,128	10,128	10,128	2.16E+08	24,564	589,000	1.178	0.241
	22	10,128	10,128	10,128	2.16E+08	24,978	589,000	1.178	0.246
	23	10,128	10,128	10,128	2.16E+08	24,288	589,000	1.178	0.239
	24	10,128	10,128	10,128	2.16E+08	25,185	589,000	1.178	0.248
	25	10,128	10,128	10,128	2.16E+08	25,944	589,000	1.178	0.255
	26	10,128	10,128	10,128	2.16E+08	25,599	589,000	1.178	0.252
	27	10,128	10,128	10,128	2.16E+08	24,978	589,000	1.178	0.246
	28	10,128	10,128	10,128	2.16E+08	25,185	589,000	1.178	0.248
	29	10,128	10,128	10,128	2.07E+08	25,185	589,000	1.178	0.248
	30	10,128	10,128	10,128	2.16E+08	25,461	589,000	1.178	0.250
	31	3,376	3,376	3,376	8.00E+06	25,392	542,333	0.362	0.077
AVERAGE		9,910	9,910	9,910	2.09E+08	25,432	587,495	1.152	0.244

ASSUMPTIONS: Drift Rate = 0.0002%

TDS ppm = 0.69 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	36,300	0	2	4	4	0	0	0
2	32,000	2,161	4	4	4	0	0	8
3	32,200	9,111	4	4	4	0	0	39
4	30,800	59,107	4	4	4	32	8	45
5	33,100	90,835	4	4	4	48	48	45
6	33,400	91,118	4	4	4	48	48	47
7	36,300	86,339	4	4	4	47	48	48
8	37,700	88,829	4	4	4	48	48	48
9	37,700	87,871	4	4	4	48	48	48
10	38,200	81,177	4	4	4	48	48	48
11	37,500	84,269	4	4	4	48	48	48
12	36,800	91,018	4	4	4	48	48	48
13	36,500	91,164	4	4	4	48	48	48
14	36,400	91,164	4	4	4	48	48	48
15	36,700	91,154	4	4	4	48	48	48
16	36,600	91,164	4	4	4	48	48	48
17	36,500	91,182	4	4	4	48	48	48
18	37,200	91,118	4	4	4	48	48	48
19	37,300	91,127	4	4	4	48	48	48
20	38,000	91,109	4	4	4	48	48	48
21	38,100	91,081	4	4	4	48	48	48
22	38,200	91,136	4	4	4	48	48	48
23	38,300	91,164	4	4	4	48	48	48
24	38,000	91,154	4	4	4	48	48	48
25	38,500	91,127	4	4	4	48	48	48
26	38,700	91,136	4	4	4	48	48	48
27	39,000	91,136	4	4	4	48	48	48
28	38,400	91,145	4	4	4	48	48	48
29	37,700	91,109	4	4	4	48	48	48
30	36,900	91,127	4	4	4	47	48	48
AVERAGE	36,633	80,411	4	4	4	43	42	45

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

SEPTEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	0	0	0	0.00E+00	28,314	495,667	0.000	0.000
2	0	0	1,688	5.12E+06	24,960	589,000	0.065	0.014
3	0	0	8,229	2.16E+07	25,116	589,000	0.319	0.067
4	6,752	1,688	9,495	1.40E+08	24,024	589,000	0.695	0.139
5	10,128	10,128	9,495	2.15E+08	25,818	589,000	1.153	0.249
6	10,128	10,128	9,917	2.16E+08	26,052	589,000	1.170	0.254
7	9,917	10,128	10,128	2.05E+08	28,314	589,000	1.170	0.276
8	10,128	10,128	10,128	2.11E+08	29,406	589,000	1.178	0.289
9	10,128	10,128	10,128	2.08E+08	29,406	589,000	1.178	0.289
10	10,128	10,128	10,128	1.92E+08	29,796	589,000	1.178	0.293
11	10,128	10,128	10,128	2.00E+08	29,250	589,000	1.178	0.288
12	10,128	10,128	10,128	2.16E+08	28,704	589,000	1.178	0.282
13	10,128	10,128	10,128	2.16E+08	28,470	589,000	1.178	0.280
14	10,128	10,128	10,128	2.16E+08	28,392	589,000	1.178	0.279
15	10,128	10,128	10,128	2.16E+08	28,626	589,000	1.178	0.281
16	10,128	10,128	10,128	2.16E+08	28,548	589,000	1.178	0.281
17	10,128	10,128	10,128	2.16E+08	28,470	589,000	1.178	0.280
18	10,128	10,128	10,128	2.16E+08	29,016	589,000	1.178	0.285
19	10,128	10,128	10,128	2.16E+08	29,094	589,000	1.178	0.286
20	10,128	10,128	10,128	2.16E+08	29,640	589,000	1.178	0.291
21	10,128	10,128	10,128	2.16E+08	29,718	589,000	1.178	0.292
22	10,128	10,128	10,128	2.16E+08	29,796	589,000	1.178	0.293
23	10,128	10,128	10,128	2.16E+08	29,874	589,000	1.178	0.294
24	10,128	10,128	10,128	2.16E+08	29,640	589,000	1.178	0.291
25	10,128	10,128	10,128	2.16E+08	30,030	589,000	1.178	0.295
26	10,128	10,128	10,128	2.16E+08	30,186	589,000	1.178	0.297
27	10,128	10,128	10,128	2.16E+08	30,420	589,000	1.178	0.299
28	10,128	10,128	10,128	2.16E+08	29,952	589,000	1.178	0.294
29	10,128	10,128	10,128	2.16E+08	29,406	589,000	1.178	0.289
30	9,917	10,128	10,128	2.16E+08	28,782	589,000	1.170	0.281
AVERAGE	8,989	8,834	9,397	1.91E+08	28,574	585,889	1.055	0.254

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.78 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

OCTOBER	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	36,300	90,963	4	4	4	48	48	48
	2	36,000	91,100	4	4	4	48	48	48
	3	35,500	91,091	4	4	4	48	48	48
	4	36,700	90,945	4	4	4	48	48	48
	5	37,000	91,018	4	4	4	48	48	48
	6	37,000	90,954	4	4	4	48	48	48
	7	36,300	90,799	4	4	4	48	48	48
	8	37,200	90,972	4	4	4	48	48	48
	9	37,100	90,972	4	4	4	48	48	48
	10	38,100	90,999	4	4	4	48	48	48
	11	38,800	91,036	4	4	4	48	48	48
	12	39,400	91,054	4	4	4	48	48	48
	13	39,100	91,109	4	4	4	48	48	48
	14	38,800	91,127	4	4	4	48	48	48
	15	38,200	91,118	4	4	4	48	48	48
	16	38,900	91,072	4	4	4	48	48	48
	17	39,100	90,990	4	4	4	48	48	48
	18	39,200	91,063	4	4	4	48	48	48
	19	38,800	91,109	4	4	4	48	48	48
	20	38,700	91,127	4	4	4	48	48	48
	21	40,400	91,127	4	4	4	48	48	48
	22	40,000	91,118	4	4	4	48	48	48
	23	39,900	91,164	4	4	4	48	48	48
	24	39,900	91,018	4	4	4	48	48	48
	25	38,600	90,972	4	4	4	48	48	48
	26	37,800	91,072	4	4	4	48	48	48
	27	39,200	30,342	4	4	4	16	16	16
	28	33,500	0	4	4	3	0	0	0
	29	32,600	0	2	2	2	0	0	0
	30	32,500	1,158	2	2	2	0	0	0
	31	31,500	19,836	2	4	4	8	0	0
AVERAGE		37,487	78,014	4	4	4	41	41	41

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

OCTOBER	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	31,218	589,000	1.178	0.307
	2	10,128	10,128	10,128	2.16E+08	30,960	589,000	1.178	0.304
	3	10,128	10,128	10,128	2.16E+08	30,530	589,000	1.178	0.300
	4	10,128	10,128	10,128	2.16E+08	31,562	589,000	1.178	0.310
	5	10,128	10,128	10,128	2.16E+08	31,820	589,000	1.178	0.313
	6	10,128	10,128	10,128	2.16E+08	31,820	589,000	1.178	0.313
	7	10,128	10,128	10,128	2.15E+08	31,218	589,000	1.178	0.307
	8	10,128	10,128	10,128	2.16E+08	31,992	589,000	1.178	0.314
	9	10,128	10,128	10,128	2.16E+08	31,906	589,000	1.178	0.314
	10	10,128	10,128	10,128	2.16E+08	32,766	589,000	1.178	0.322
	11	10,128	10,128	10,128	2.16E+08	33,368	589,000	1.178	0.328
	12	10,128	10,128	10,128	2.16E+08	33,884	589,000	1.178	0.333
	13	10,128	10,128	10,128	2.16E+08	33,626	589,000	1.178	0.331
	14	10,128	10,128	10,128	2.16E+08	33,368	589,000	1.178	0.328
	15	10,128	10,128	10,128	2.16E+08	32,852	589,000	1.178	0.323
	16	10,128	10,128	10,128	2.16E+08	33,454	589,000	1.178	0.329
	17	10,128	10,128	10,128	2.16E+08	33,626	589,000	1.178	0.331
	18	10,128	10,128	10,128	2.16E+08	33,712	589,000	1.178	0.331
	19	10,128	10,128	10,128	2.16E+08	33,368	589,000	1.178	0.328
	20	10,128	10,128	10,128	2.16E+08	33,282	589,000	1.178	0.327
	21	10,128	10,128	10,128	2.16E+08	34,744	589,000	1.178	0.342
	22	10,128	10,128	10,128	2.16E+08	34,400	589,000	1.178	0.338
	23	10,128	10,128	10,128	2.16E+08	34,314	589,000	1.178	0.337
	24	10,128	10,128	10,128	2.16E+08	34,314	589,000	1.178	0.337
	25	10,128	10,128	10,128	2.16E+08	33,196	589,000	1.178	0.326
	26	10,128	10,128	10,128	2.16E+08	32,508	589,000	1.178	0.320
	27	3,376	3,376	3,376	7.19E+07	33,712	589,000	0.393	0.110
	28	0	0	0	0.00E+00	28,810	542,333	0.000	0.000
	29	0	0	0	0.00E+00	28,036	309,000	0.000	0.000
	30	0	0	0	2.74E+06	27,950	309,000	0.000	0.000
	31	1,688	0	0	4.70E+07	27,090	495,667	0.055	0.012
AVERAGE		8,658	8,603	8,603	1.85E+08	32,239	566,419	1.002	0.275

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	29,600	78,459	4	4	4	48	31	8
2	31,000	91,009	4	4	4	48	48	45
3	32,200	91,145	4	4	4	48	48	45
4	30,160	91,081	4	4	4	48	48	46
5	24,200	91,109	4	4	4	48	48	48
6	32,200	91,118	4	4	4	48	48	48
7	33,000	91,173	4	4	4	48	48	48
8	34,300	91,127	4	4	4	48	48	48
9	35,200	91,182	4	4	4	48	48	48
10	35,700	91,191	4	4	4	48	48	48
11	36,700	91,164	4	4	4	48	48	48
12	36,500	91,136	4	4	4	48	48	46
13	36,900	91,118	4	4	4	48	48	45
14	36,900	56,982	4	4	4	40	40	38
15	33,800	0	4	2	2	0	0	0
16	31,100	0	2	2	2	0	0	0
17	30,200	0	2	2	3	0	0	0
18	31,200	0	3	3	3	0	0	0
19	30,700	0	3	3	3	0	0	0
20	31,100	0	3	3	3	0	0	0
21	30,000	0	3	3	4	0	0	0
22	29,000	0	4	4	4	0	0	0
23	28,900	0	4	4	4	0	0	0
24	28,300	0	4	4	4	0	0	0
25	28,400	265	4	4	4	0	0	0
26	29,600	6,302	4	4	4	2	0	0
27	30,900	28,217	4	4	4	11	5	0
28	30,400	64,296	4	4	4	48	41	0
29	30,400	63,904	4	4	4	48	48	0
30	31,300	63,968	4	4	4	48	41	0
AVERAGE	31,662	48,532	4	4	4	27	26	20

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

NOVEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	6,541	1,688	1.86E+08	24,568	589,000	0.712	0.146
2	10,128	10,128	9,495	2.16E+08	25,730	589,000	1.153	0.248
3	10,128	10,128	9,495	2.16E+08	26,726	589,000	1.153	0.257
4	10,128	10,128	9,706	2.16E+08	25,033	589,000	1.162	0.243
5	10,128	10,128	10,128	2.16E+08	20,086	589,000	1.178	0.197
6	10,128	10,128	10,128	2.16E+08	26,726	589,000	1.178	0.263
7	10,128	10,128	10,128	2.16E+08	27,390	589,000	1.178	0.269
8	10,128	10,128	10,128	2.16E+08	28,469	589,000	1.178	0.280
9	10,128	10,128	10,128	2.16E+08	29,216	589,000	1.178	0.287
10	10,128	10,128	10,128	2.16E+08	29,631	589,000	1.178	0.291
11	10,128	10,128	10,128	2.16E+08	30,461	589,000	1.178	0.299
12	10,128	10,128	9,706	2.16E+08	30,295	589,000	1.162	0.294
13	10,128	10,128	9,495	2.16E+08	30,627	589,000	1.153	0.295
14	8,440	8,440	8,018	1.35E+08	30,627	589,000	0.965	0.247
15	0	0	0	0.00E+00	28,054	402,333	0.000	0.000
16	0	0	0	0.00E+00	25,813	309,000	0.000	0.000
17	0	0	0	0.00E+00	25,066	355,667	0.000	0.000
18	0	0	0	0.00E+00	25,896	449,000	0.000	0.000
19	0	0	0	0.00E+00	25,481	449,000	0.000	0.000
20	0	0	0	0.00E+00	25,813	449,000	0.000	0.000
21	0	0	0	0.00E+00	24,900	495,667	0.000	0.000
22	0	0	0	0.00E+00	24,070	589,000	0.000	0.000
23	0	0	0	0.00E+00	23,987	589,000	0.000	0.000
24	0	0	0	0.00E+00	23,489	589,000	0.000	0.000
25	0	0	0	6.28E+05	23,572	589,000	0.000	0.000
26	422	0	0	1.49E+07	24,568	589,000	0.016	0.003
27	2,321	1,055	0	6.69E+07	25,647	589,000	0.131	0.028
28	10,128	8,651	0	1.52E+08	25,232	589,000	0.728	0.153
29	10,128	10,128	0	1.51E+08	25,232	589,000	0.785	0.165
30	10,128	8,651	0	1.52E+08	25,979	589,000	0.728	0.158
AVERAGE	5,774	5,500	4,283	1.15E+08	26,279	548,556	0.603	0.137

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.83 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
INPUT DATA - UNIT 3

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	32,300	81,277	4	4	4	48	13	26
2	32,000	91,136	4	4	4	46	48	37
3	33,000	91,136	4	4	4	26	48	46
4	33,700	91,182	4	4	4	30	48	48
5	32,800	91,173	4	4	4	45	48	48
6	33,900	91,182	4	4	4	44	47	48
7	34,400	91,164	4	4	4	44	48	48
8	34,900	91,191	4	4	4	45	48	48
9	36,100	91,182	4	4	4	45	48	46
10	36,100	91,164	4	4	4	45	48	45
11	34,900	91,191	4	4	4	45	48	45
12	36,300	91,173	4	4	4	45	48	45
13	35,800	91,200	4	4	4	46	48	40
14	36,100	91,182	4	4	4	48	48	48
15	37,200	91,191	4	4	4	48	48	48
16	37,900	91,173	4	4	4	48	48	48
17	38,200	91,145	4	4	4	48	48	48
18	39,200	91,191	4	4	4	48	48	48
19	39,400	91,200	4	4	4	48	48	48
20	38,800	91,191	4	4	4	48	48	48
21	38,700	91,164	4	4	4	48	48	45
22	37,700	91,164	4	4	4	48	48	45
23	38,600	91,173	4	4	4	44	48	42
24	38,500	91,154	4	4	4	43	48	42
25	37,800	91,164	4	4	4	39	48	42
26	37,100	91,154	4	4	4	48	29	38
27	33,900	90,434	4	4	4	48	42	42
28	37,800	88,865	4	4	4	48	42	42
29	37,400	91,191	4	4	4	48	42	42
30	37,200	91,182	4	4	4	48	42	42
31	36,800	91,182	4	4	4	48	42	42
AVERAGE	36,274	90,756	4	4	4	45	45	44

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1991
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

DECEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	2,743	5,486	1.93E+08	26,486	589,000	0.712	0.157
2	9,706	10,128	7,807	2.16E+08	26,240	589,000	1.072	0.235
3	5,486	10,128	9,706	2.16E+08	27,060	589,000	0.982	0.222
4	6,330	10,128	10,128	2.16E+08	27,634	589,000	1.031	0.238
5	9,495	10,128	10,128	2.16E+08	26,896	589,000	1.153	0.259
6	9,284	9,917	10,128	2.16E+08	27,798	589,000	1.137	0.264
7	9,284	10,128	10,128	2.16E+08	28,208	589,000	1.145	0.270
8	9,495	10,128	10,128	2.16E+08	28,618	589,000	1.153	0.275
9	9,495	10,128	9,706	2.16E+08	29,602	589,000	1.137	0.281
10	9,495	10,128	9,495	2.16E+08	29,602	589,000	1.129	0.279
11	9,495	10,128	9,495	2.16E+08	28,618	589,000	1.129	0.270
12	9,495	10,128	9,495	2.16E+08	29,766	589,000	1.129	0.280
13	9,706	10,128	8,440	2.16E+08	29,356	589,000	1.096	0.269
14	10,128	10,128	10,128	2.16E+08	29,602	589,000	1.178	0.291
15	10,128	10,128	10,128	2.16E+08	30,504	589,000	1.178	0.300
16	10,128	10,128	10,128	2.16E+08	31,078	589,000	1.178	0.306
17	10,128	10,128	10,128	2.16E+08	31,324	589,000	1.178	0.308
18	10,128	10,128	10,128	2.16E+08	32,144	589,000	1.178	0.316
19	10,128	10,128	10,128	2.16E+08	32,308	589,000	1.178	0.318
20	10,128	10,128	10,128	2.16E+08	31,816	589,000	1.178	0.313
21	10,128	10,128	9,495	2.16E+08	31,734	589,000	1.153	0.305
22	10,128	10,128	9,495	2.16E+08	30,914	589,000	1.153	0.298
23	9,284	10,128	8,862	2.16E+08	31,652	589,000	1.096	0.290
24	9,073	10,128	8,862	2.16E+08	31,570	589,000	1.088	0.287
25	8,229	10,128	8,862	2.16E+08	30,996	589,000	1.055	0.273
26	10,128	6,119	8,018	2.16E+08	30,422	589,000	0.941	0.239
27	10,128	8,862	8,862	2.14E+08	27,798	589,000	1.080	0.250
28	10,128	8,862	8,862	2.11E+08	30,996	589,000	1.080	0.279
29	10,128	8,862	8,862	2.16E+08	30,668	589,000	1.080	0.276
30	10,128	8,862	8,862	2.16E+08	30,504	589,000	1.080	0.275
31	10,128	8,862	8,862	2.16E+08	30,176	589,000	1.080	0.272
AVERAGE	9,529	9,549	9,325	2.15E+08	29,745	589,000	1.101	0.274

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.82 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

APPENDIX B

COOLING TOWER BASIN WATER

Appendix B
Cooling Tower Basin Water

Cooling tower basin water samples are usually collected once per month from the cooling tower basins of PVNGS Units 1-3. Sample collection is dependent upon each representative unit's operational status during the month. Presented in this appendix are the data on 31 parameters for those months of 1991 during which the units were operating: February through December for Unit 1; January through September for Unit 2; and January, February, March, and June through December for Unit 3. No sample was taken during May for either Units 1, 2, or 3. Values below the detectable limit of the laboratory procedure are preceded by minus signs. Missing data are represented by a field of "9s."

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36988-2-3
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	01-28-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36988-2-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	01-28-91

Determination (mg/l)	
Calcium, total	530
Magnesium, total	71.0
Sodium, total	6600
Chloride	6100
Sulfate (as SO4)	5200
Nitrate (as N)	470.0
Silica (as SiO2)	120
Phosphate	3.20
Fluoride	17.0
Potassium, total	430
Copper, total	0.064
Zinc, total	0.056
Iron, total	0.28
Arsenic, total	0.022
Boron	6.0
Ammonium	0.5
TSS (at 105 Deg C)	20
COD	260
Alkalinity, total	40
TDS (at 180 Deg C)	21000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.024
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.016
Phenol	-0.005
Conductivity mmhos/cm	38000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36988-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	01-28-91

Determination (mg/l)	
Calcium, total	220
Magnesium, total	28.0
Sodium, total	3200
Chloride	3400
Sulfate (as SO4)	2200
Nitrate (as N)	290.0
Silica (as SiO2)	68
Phosphate	1.80
Fluoride	9.7
Potassium, total	150
Copper, total	0.037
Zinc, total	0.029
Iron, total	0.24
Arsenic, total	0.014
Boron	3.3
Ammonium	0.3
TSS (at 105 Deg C)	21
COD	250
Alkalinity, total	26
TDS (at 180 Deg C)	11000
Silver, total	-0.005
Barium, total	-0.1
Cadmium, total	-0.005
Chromium, total	0.017
Lead, total	-0.025
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.011
Phenol	-0.005
Conductivity mmhos/cm	22000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37308-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	02-27-91

Determination (mg/l)	
Calcium, total	420
Magnesium, total	39.0
Sodium, total	6000
Chloride	5700
Sulfate (as SO4)	3700
Nitrate (as N)	470.0
Silica (as SiO2)	100
Phosphate	1.80
Fluoride	21.0
Potassium, total	290
Copper, total	0.064
Zinc, total	0.058
Iron, total	0.52
Arsenic, total	0.021
Boron	5.7
Ammonium	0.5
TSS (at 105 Deg C)	54
COD	460
Alkalinity, total	57
TDS (at 180 Deg C)	20000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.050
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.150
Manganese, total	0.016
Phenol	-0.005
Conductivity mmhos/cm	36000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37308-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	02-27-91

Determination (mg/l)	
Calcium, total	430
Magnesium, total	41.0
Sodium, total	6500
Chloride	6200
Sulfate (as SO4)	3800
Nitrate (as N)	540.0
Silica (as SiO2)	120
Phosphate	1.30
Fluoride	19.0
Potassium, total	290
Copper, total	0.052
Zinc, total	0.042
Iron, total	0.36
Arsenic, total	0.021
Boron	6.0
Ammonium	0.7
TSS (at 105 Deg C)	34
COD	610
Alkalinity, total	31
TDS (at 180 Deg C)	21000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.028
Lead, total	-0.050
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.015
Phenol	-0.005
Conductivity mmhos/cm	36000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37308-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	02-27-91

Determination (mg/l)	
Calcium, total	310
Magnesium, total	30.0
Sodium, total	4400
Chloride	4300
Sulfate (as SO4)	3100
Nitrate (as N)	370.0
Silica (as SiO2)	86
Phosphate	1.50
Fluoride	15.0
Potassium, total	180
Copper, total	0.047
Zinc, total	0.022
Iron, total	0.36
Arsenic, total	0.016
Boron	4.4
Ammonium	0.4
TSS (at 105 Deg C)	22
COD	450
Alkalinity, total	38
TDS (at 180 Deg C)	15000
Silver, total	-0.005
Barium, total	-0.1
Cadmium, total	-0.005
Chromium, total	0.022
Lead, total	-0.010
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.013
Phenol	-0.005
Conductivity mmhos/cm	25000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37639-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	03-27-91

Determination (mg/l)	
Calcium, total	490
Magnesium, total	42.0
Sodium, total	7400
Chloride	7000
Sulfate (as SO4)	5400
Nitrate (as N)	440.0
Silica (as SiO2)	100
Phosphate	3.40
Fluoride	18.0
Potassium, total	340
Copper, total	0.062
Zinc, total	0.054
Iron, total	0.31
Arsenic, total	0.019
Boron	6.1
Ammonium	0.7
TSS (at 105 Deg C)	57
COD	630
Alkalinity, total	67
TDS (at 180 Deg C)	23000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.029
Lead, total	-0.010
Mercury, total	-0.0002
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.012
Phenol	-0.005
Conductivity mmhos/cm	34000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37639-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	03-27-91

Determination (mg/l)	
Calcium, total	470
Magnesium, total	41.0
Sodium, total	7100
Chloride	7000
Sulfate (as SO4)	4500
Nitrate (as N)	450.0
Silica (as SiO2)	100
Phosphate	3.50
Fluoride	18.0
Potassium, total	330
Copper, total	0.060
Zinc, total	0.055
Iron, total	0.38
Arsenic, total	0.020
Boron	6.7
Ammonium	0.6
TSS (at 105 Deg C)	52
COD	650
Alkalinity, total	67
TDS (at 180 Deg C)	23000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.027
Lead, total	-0.010
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.012
Phenol	0.006
Conductivity mmhos/cm	35000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37639-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	03-27-91

Determination (mg/l)	
Calcium, total	300
Magnesium, total	25.0
Sodium, total	4200
Chloride	3800
Sulfate (as SO4)	3200
Nitrate (as N)	260.0
Silica (as SiO2)	64
Phosphate	2.00
Fluoride	11.0
Potassium, total	190
Copper, total	0.062
Zinc, total	0.073
Iron, total	0.33
Arsenic, total	0.012
Boron	4.2
Ammonium	0.3
TSS (at 105 Deg C)	46
COD	350
Alkalinity, total	34
TDS (at 180 Deg C)	13000
Silver, total	-0.005
Barium, total	-0.1
Cadmium, total	-0.005
Chromium, total	0.019
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.020
Manganese, total	0.013
Phenol	-0.005
Conductivity mmhos/cm	21000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37911-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	04-18-91

Determination (mg/l)	
Calcium, total	450
Magnesium, total	44.0
Sodium, total	8500
Chloride	7600
Sulfate (as SO4)	6500
Nitrate (as N)	440.0
Silica (as SiO2)	110
Phosphate	1.90
Fluoride	21.0
Potassium, total	410
Copper, total	0.083
Zinc, total	0.046
Iron, total	0.37
Arsenic, total	0.028
Boron	6.2
Ammonium	0.7
TSS (at 105 Deg C)	38
COD	650
Alkalinity, total	52
TDS (at 180 Deg C)	24000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.032
Lead, total	-0.010
Mercury, total	0.0005
Beryllium, total	0.008
Selenium, total	-0.100
Manganese, total	0.012
Phenol	-0.005
Conductivity mmhos/cm	40000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37911-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	04-18-91

Determination (mg/l)	
Calcium, total	440
Magnesium, total	45.0
Sodium, total	8000
Chloride	7100
Sulfate (as SO4)	6700
Nitrate (as N)	440.0
Silica (as SiO2)	100
Phosphate	2.00
Fluoride	20.0
Potassium, total	400
Copper, total	0.084
Zinc, total	0.040
Iron, total	0.40
Arsenic, total	0.028
Boron	6.1
Ammonium	3.7
TSS (at 105 Deg C)	34
COD	780
Alkalinity, total	50
TDS (at 180 Deg C)	23000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.020
Mercury, total	0.0003
Beryllium, total	0.008
Selenium, total	-0.100
Manganese, total	0.013
Phenol	0.007
Conductivity mmhos/cm	41000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-37911-2-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	04-18-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A P U B L I C S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	05-15-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	05-15-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	05-15-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-38691-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	06-20-91

Determination (mg/l)	
Calcium, total	330
Magnesium, total	18.0
Sodium, total	6900
Chloride	7900
Sulfate (as SO4)	4800
Nitrate (as N)	300.0
Silica (as SiO2)	94
Phosphate	1.10
Fluoride	20.0
Potassium, total	320
Copper, total	0.071
Zinc, total	0.029
Iron, total	0.32
Arsenic, total	0.012
Boron	5.4
Ammonium	0.4
TSS (at 105 Deg C)	27
COD	430
Alkalinity, total	26
TDS (at 180 Deg C)	22000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	0.007
Chromium, total	0.022
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.007
Phenol	-0.005
Conductivity mmhos/cm	37000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-38691-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	06-20-91

Determination (mg/l)	
Calcium, total	340
Magnesium, total	18.0
Sodium, total	6900
Chloride	8100
Sulfate (as SO4)	5100
Nitrate (as N)	280.0
Silica (as SiO2)	100
Phosphate	1.00
Fluoride	20.0
Potassium, total	320
Copper, total	0.068
Zinc, total	0.030
Iron, total	0.29
Arsenic, total	-0.025
Boron	5.5
Ammonium	0.3
TSS (at 105 Deg C)	26
COD	420
Alkalinity, total	31
TDS (at 180 Deg C)	22000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	0.006
Chromium, total	0.028
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.007
Phenol	-0.005
Conductivity mmhos/cm	36000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-38691-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	06-20-91

Determination (mg/l)	
Calcium, total	350
Magnesium, total	18.0
Sodium, total	6700
Chloride	8300
Sulfate (as SO4)	5100
Nitrate (as N)	290.0
Silica (as SiO2)	110
Phosphate	1.20
Fluoride	24.0
Potassium, total	320
Copper, total	0.120
Zinc, total	0.047
Iron, total	0.50
Arsenic, total	0.014
Boron	5.3
Ammonium	0.4
TSS (at 105 Deg C)	60
COD	520
Alkalinity, total	36
TDS (at 180 Deg C)	22000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.028
Lead, total	-0.025
Mercury, total	0.0005
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.013
Phenol	-0.005
Conductivity mmhos/cm	37000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39134-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	07-24-91

Determination (mg/l)	
Calcium, total	480
Magnesium, total	30.0
Sodium, total	7600
Chloride	9400
Sulfate (as SO4)	5700
Nitrate (as N)	300.0
Silica (as SiO2)	130
Phosphate	0.70
Fluoride	21.0
Potassium, total	380
Copper, total	0.078
Zinc, total	0.032
Iron, total	0.35
Arsenic, total	-0.025
Boron	6.3
Ammonium	0.7
TSS (at 105 Deg C)	23
COD	580
Alkalinity, total	30
TDS (at 180 Deg C)	24000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.035
Lead, total	-0.025
Mercury, total	0.0005
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.007
Phenol	0.006
Conductivity mmhos/cm	45000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39134-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	07-24-91

Determination (mg/l)	
Calcium, total	470
Magnesium, total	30.0
Sodium, total	7600
Chloride	9500
Sulfate (as SO4)	5600
Nitrate (as N)	320.0
Silica (as SiO2)	120
Phosphate	0.66
Fluoride	12.0
Potassium, total	360
Copper, total	0.061
Zinc, total	0.040
Iron, total	0.36
Arsenic, total	-0.025
Boron	5.8
Ammonium	0.8
TSS (at 105 Deg C)	46
COD	350
Alkalinity, total	36
TDS (at 180 Deg C)	25000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.025
Manganese, total	0.011
Phenol	0.007
Conductivity mmhos/cm	44000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39134-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	07-24-91

Determination (mg/l)	
Calcium, total	440
Magnesium, total	27.0
Sodium, total	7200
Chloride	8900
Sulfate (as SO4)	5300
Nitrate (as N)	300.0
Silica (as SiO2)	110
Phosphate	0.62
Fluoride	11.0
Potassium, total	340
Copper, total	0.052
Zinc, total	0.031
Iron, total	0.43
Arsenic, total	-0.025
Boron	5.4
Ammonium	0.4
TSS (at 105 Deg C)	38
COD	680
Alkalinity, total	36
TDS (at 180 Deg C)	24000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.025
Mercury, total	0.0006
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.012
Phenol	0.008
Conductivity mmhos/cm	41000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39501-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	08-22-91

Determination (mg/l)	
Calcium, total	340
Magnesium, total	22.0
Sodium, total	9100
Chloride	9300
Sulfate (as SO4)	5100
Nitrate (as N)	280.0
Silica (as SiO2)	120
Phosphate	0.66
Fluoride	25.0
Potassium, total	450
Copper, total	0.040
Zinc, total	0.029
Iron, total	0.41
Arsenic, total	0.014
Boron	6.7
Ammonium	0.5
TSS (at 105 Deg C)	77
COD	520
Alkalinity, total	33
TDS (at 180 Deg C)	25000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.032
Lead, total	-0.020
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	0.012
Manganese, total	0.006
Phenol	0.010
Conductivity mmhos/cm	37000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39501-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	08-22-91

Determination (mg/l)	
Calcium, total	420
Magnesium, total	28.0
Sodium, total	8600
Chloride	9500
Sulfate (as SO4)	5300
Nitrate (as N)	290.0
Silica (as SiO2)	130
Phosphate	0.76
Fluoride	25.0
Potassium, total	440
Copper, total	0.057
Zinc, total	0.043
Iron, total	0.53
Arsenic, total	0.014
Boron	7.1
Ammonium	0.4
TSS (at 105 Deg C)	68
COD	490
Alkalinity, total	39
TDS (at 180 Deg C)	26000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.027
Lead, total	-0.020
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	0.019
Manganese, total	0.016
Phenol	0.007
Conductivity mmhos/cm	39000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39501-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	08-22-91

Determination (mg/l)	
Calcium, total	380
Magnesium, total	24.0
Sodium, total	9000
Chloride	9800
Sulfate (as SO4)	5800
Nitrate (as N)	260.0
Silica (as SiO2)	120
Phosphate	0.64
Fluoride	26.0
Potassium, total	410
Copper, total	0.045
Zinc, total	0.029
Iron, total	0.40
Arsenic, total	0.014
Boron	7.2
Ammonium	0.4
TSS (at 105 Deg C)	60
COD	520
Alkalinity, total	33
TDS (at 180 Deg C)	25000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.029
Lead, total	-0.020
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	0.006
Manganese, total	0.008
Phenol	0.008
Conductivity mmhos/cm	38000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39956-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	09-26-91

Determination (mg/l)	
Calcium, total	420
Magnesium, total	23.0
Sodium, total	8500
Chloride	10000
Sulfate (as SO4)	6900
Nitrate (as N)	330.0
Silica (as SiO2)	120
Phosphate	1.10
Fluoride	4.6
Potassium, total	370
Copper, total	0.059
Zinc, total	0.076
Iron, total	0.67
Arsenic, total	-0.100
Boron	8.0
Ammonium	0.4
TSS (at 105 Deg C)	51
COD	550
Alkalinity, total	41
TDS (at 180 Deg C)	27000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.032
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.014
Phenol	0.006
Conductivity mmhos/cm	50000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39956-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	09-26-91

Determination (mg/l)	
Calcium, total	440
Magnesium, total	26.0
Sodium, total	9400
Chloride	11000
Sulfate (as SO4)	7400
Nitrate (as N)	380.0
Silica (as SiO2)	140
Phosphate	1.30
Fluoride	5.0
Potassium, total	420
Copper, total	0.057
Zinc, total	0.030
Iron, total	0.42
Arsenic, total	-0.100
Boron	8.7
Ammonium	0.5
TSS (at 105 Deg C)	48
COD	640
Alkalinity, total	36
TDS (at 180 Deg C)	29000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.025
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.009
Phenol	0.008
Conductivity mmhos/cm	55000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-39956-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	09-26-91

Determination (mg/l)	
Calcium, total	450
Magnesium, total	26.0
Sodium, total	9600
Chloride	10000
Sulfate (as SO4)	6700
Nitrate (as N)	340.0
Silica (as SiO2)	140
Phosphate	1.30
Fluoride	4.8
Potassium, total	420
Copper, total	0.060
Zinc, total	0.051
Iron, total	0.53
Arsenic, total	-0.100
Boron	8.8
Ammonium	0.5
TSS (at 105 Deg C)	50
COD	150
Alkalinity, total	36
TDS (at 180 Deg C)	30000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.054
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.013
Phenol	-0.005
Conductivity mmhos/cm	52000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-40443-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	10-29-91

Determination (mg/l)	
Calcium, total	380
Magnesium, total	22.0
Sodium, total	8800
Chloride	9800
Sulfate (as SO4)	7500
Nitrate (as N)	320.0
Silica (as SiO2)	100
Phosphate	2.40
Fluoride	24.0
Potassium, total	410
Copper, total	0.074
Zinc, total	0.050
Iron, total	0.44
Arsenic, total	-0.200
Boron	7.1
Ammonium	0.4
TSS (at 105 Deg C)	13
COD	340
Alkalinity, total	36
TDS (at 180 Deg C)	27000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.032
Lead, total	-0.100
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.009
Phenol	0.008
Conductivity mmhos/cm	46000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	10-29-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-40443-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	10-29-91

Determination (mg/l)	
Calcium, total	360
Magnesium, total	23.0
Sodium, total	8400
Chloride	9600
Sulfate (as SO4)	7100
Nitrate (as N)	340.0
Silica (as SiO2)	96
Phosphate	2.60
Fluoride	23.0
Potassium, total	390
Copper, total	0.064
Zinc, total	0.035
Iron, total	0.47
Arsenic, total	-0.100
Boron	6.6
Ammonium	0.3
TSS (at 105 Deg C)	20
COD	300
Alkalinity, total	36
TDS (at 180 Deg C)	28000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.036
Lead, total	-0.050
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.013
Phenol	0.006
Conductivity mmhos/cm	44000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-40778-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	11-21-91

Determination (mg/l)	
Calcium, total	330
Magnesium, total	31.0
Sodium, total	9300
Chloride	9600
Sulfate (as SO4)	7800
Nitrate (as N)	340.0
Silica (as SiO2)	73
Phosphate	2.40
Fluoride	28.0
Potassium, total	480
Copper, total	0.047
Zinc, total	0.038
Iron, total	0.43
Arsenic, total	-0.200
Boron	6.8
Ammonium	0.2
TSS (at 105 Deg C)	44
COD	340
Alkalinity, total	50
TDS (at 180 Deg C)	31000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.032
Lead, total	-0.200
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.012
Phenol	0.011
Conductivity mmhos/cm	48000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	11-21-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-40778-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	11-21-91

Determination (mg/l)	
Calcium, total	270
Magnesium, total	24.0
Sodium, total	7700
Chloride	7900
Sulfate (as SO4)	6700
Nitrate (as N)	270.0
Silica (as SiO2)	92
Phosphate	2.00
Fluoride	23.0
Potassium, total	390
Copper, total	0.041
Zinc, total	0.035
Iron, total	0.31
Arsenic, total	-0.200
Boron	5.7
Ammonium	0.2
TSS (at 105 Deg C)	17
COD	250
Alkalinity, total	35
TDS (at 180 Deg C)	25000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.023
Lead, total	-0.200
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.011
Phenol	0.006
Conductivity mmhos/cm	40000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-41110-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	12-18-91

Determination (mg/l)	
Calcium, total	390
Magnesium, total	36.0
Sodium, total	9900
Chloride	9600
Sulfate (as SO4)	9200
Nitrate (as N)	470.0
Silica (as SiO2)	120
Phosphate	2.40
Fluoride	26.0
Potassium, total	450
Copper, total	0.059
Zinc, total	0.047
Iron, total	0.38
Arsenic, total	-0.500
Boron	7.5
Ammonium	0.6
TSS (at 105 Deg C)	37
COD	450
Alkalinity, total	51
TDS (at 180 Deg C)	32000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.046
Lead, total	0.280
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.010
Phenol	0.019
Conductivity mmhos/cm	48000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	12-18-91

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	99999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-41110-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	12-18-91

Determination (mg/l)	
Calcium, total	370
Magnesium, total	34.0
Sodium, total	8900
Chloride	9000
Sulfate (as SO4)	9800
Nitrate (as N)	520.0
Silica (as SiO2)	120
Phosphate	2.50
Fluoride	28.0
Potassium, total	430
Copper, total	0.056
Zinc, total	0.041
Iron, total	0.32
Arsenic, total	-0.500
Boron	6.9
Ammonium	0.6
TSS (at 105 Deg C)	52
COD	590
Alkalinity, total	56
TDS (at 180 Deg C)	32000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.044
Lead, total	0.230
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.009
Phenol	0.017
Conductivity mmhos/cm	50000

APPENDIX C

DUSTFALL DATA

Appendix C
Dustfall Data

This appendix presents all the airborne salt drift deposition data obtained during the period January through December 1991 at the 48 PVNGS monitoring sites (sites 1-28, 30-45, and 80-83).

Drift deposition samples were collected each month and analyzed for the concentration of ions of interest by Accu-Labs Research, Inc., in Golden, Colorado.

HALLIBURTON NUS converted the laboratory results for each of the two collocated samplers to average deposition rates in pounds per acre per month based on the collection jar surface area and each sample's collection period and water volume. No corrections were applied to the deposition rates to account for the presence of ions in the collection water at the beginning of the sampling period. Except for bicarbonate, the concentrations of these ions in the water were below the detection limits of the laboratory analytical methods for the monitoring program, and their presence did not contribute to the calculation of significant deposition rates. The solubility of bicarbonate in a sample is influenced more by the pH, the ambient temperature, and the presence of other ions in the sample than by the initial concentration in the collection water.

The deposition rates were tabulated by location for each of the 12 months. The attached monthly data tables present the calculated deposition rates for each of the selected ions and for total suspended solids. In the column to the right of each monthly chemical deposition rate is a value, identified as "d," which is the absolute difference between the two samples at each location. If one of the samples was missing or invalid, a field of "9s" appears in the "d" column. If both samples were missing or invalid, a field of "9s" appears in all positions for that location. Those values reported as below the detection limit are included at one-half the detection limit value.

For each location, a mean for the values of "d" and a corresponding standard deviation were determined to assess the precision of the measurements.

Arithmetic means and the standard deviations of the arithmetic means were determined for each ion as an aid in assessing the calculated deposition rates. The significant figures listed for the means and the standard deviations were determined by the computer data field lengths assigned to the chemical; they do not represent the accuracy of the measurements.

For those ions reported as below the laboratory detection limit, a value of one-half the laboratory detection limit was used to calculate the mean of the collocated samples. In those cases in which both collocated samples are reported as below the laboratory detection limit, the absolute difference between the two samples, "d," represents the difference of the reported normalized sample volumes.

Included in a comments table for each month's samples are significant comments on the validity of the analyzed samples or on special conditions at the monitoring locations. For the 12-month period, there were 5 occasions in which neither sample at a location produced valid data. There were also 30 occasions in which one sample at a location was invalidated; either the jars were knocked over by cattle or the sample itself was contaminated by birds or insects. The overall deposition sample recovery rate for the period January 1991 through December 1991 was 97 percent.

The sample data have been reviewed for data entry errors and for consistency of paired samples and consistency of samples collected at similar locations. Contaminated samples have been identified and those values removed from the tables.

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 1-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	1.768	0.02	0.209	0.02	0.834	0.09	0.080	0.06	1.559	0.05	0.522	0.05	1.043	0.11	0.188	0.02
002	1.615	0.10	0.343	0.21	1.273	0.31	0.058	0.00	1.266	0.15	0.577	0.03	1.154	0.07	0.250	0.22
003	1.579	0.24	0.243	0.00	1.094	0.24	0.103	0.09	1.336	0.24	0.607	0.00	1.215	0.00	0.103	0.09
004	0.775	0.14	0.223	0.02	0.775	0.14	0.056	0.01	0.598	0.49	0.558	0.06	1.115	0.12	0.085	0.06
005	0.912	0.02	0.228	0.00	0.912	0.02	0.057	0.00	0.796	0.21	0.570	0.01	1.140	0.02	0.085	0.06
006	1.134	0.03	0.208	0.04	0.718	0.06	0.052	0.01	0.926	0.02	0.520	0.11	1.040	0.21	0.113	0.11
007	0.450	0.01	0.225	0.00	0.900	0.01	0.056	0.00	0.338	0.00	0.563	0.01	1.125	0.02	0.056	0.00
008	0.564	0.18	0.227	0.02	0.455	0.04	0.057	0.00	0.341	0.03	0.568	0.05	1.137	0.09	0.084	0.05
009	0.985	0.04	0.246	0.01	0.739	0.03	0.062	0.00	0.550	0.35	0.616	0.03	1.232	0.05	0.062	0.00
010	0.982	0.09	0.220	0.03	0.659	0.09	0.055	0.01	0.762	0.12	0.550	0.07	1.099	0.14	0.141	0.05
011	0.654	0.06	0.218	0.02	0.768	0.29	0.055	0.01	0.498	0.37	0.545	0.05	1.090	0.10	0.091	0.07
012	0.447	0.00	0.223	0.00	0.558	0.23	0.056	0.00	0.335	0.00	0.558	0.00	1.116	0.01	0.134	0.00
013	0.638	0.32	0.385	0.29	1.396	0.39	0.178	0.07	0.379	0.04	0.632	0.06	1.263	0.13	0.063	0.01
014	3.138	0.19	0.232	0.00	1.045	0.22	0.058	0.00	2.907	0.28	0.581	0.01	2.325	0.03	0.158	0.20
015	0.486	0.03	0.181	0.11	0.729	0.04	0.061	0.00	0.364	0.02	0.607	0.03	1.214	0.06	0.061	0.00
016	3.861	0.20	0.351	0.23	0.936	0.01	0.059	0.00	2.689	1.15	0.585	0.00	4.680	0.04	0.386	0.03
017	0.740	0.31	0.209	0.03	0.419	0.06	0.052	0.01	0.314	0.04	0.524	0.07	1.047	0.14	0.052	0.01
018	1.257	0.30	0.210	0.05	0.629	0.15	0.052	0.01	1.048	0.25	0.524	0.12	1.048	0.25	0.114	0.01
019	1.370	0.03	0.228	0.01	0.685	0.02	0.057	0.00	1.026	0.20	0.571	0.01	1.142	0.03	0.097	0.08
020	13.764	1.74	1.016	0.05	1.804	0.14	0.180	0.01	13.124	0.04	0.570	0.10	14.720	0.32	1.014	0.09
021	0.443	0.05	0.222	0.02	0.770	0.14	0.085	0.06	0.332	0.03	0.554	0.06	1.108	0.12	0.055	0.01
022	0.412	0.01	0.206	0.01	0.514	0.19	0.052	0.00	0.309	0.01	0.515	0.01	1.031	0.03	0.052	0.00
023	2.018	0.31	3.029	0.26	13.847	0.03	4.144	0.01	1.312	0.14	0.506	0.02	1.011	0.05	0.262	0.03
024	0.458	0.03	0.170	0.10	0.576	0.26	0.057	0.00	0.344	0.02	0.573	0.03	1.145	0.06	0.057	0.00
025	0.388	0.07	0.476	0.11	1.374	0.63	0.550	0.04	0.449	0.37	0.485	0.09	0.969	0.17	0.075	0.06
026	0.537	0.21	0.161	0.11	0.537	0.21	0.054	0.00	0.323	0.00	0.538	0.00	1.075	0.01	0.054	0.00
027	0.832	0.08	0.317	0.24	0.515	0.16	0.052	0.00	0.461	0.27	0.520	0.05	1.040	0.10	0.052	0.00
028	0.664	0.19	0.190	0.00	0.949	0.37	0.047	0.00	0.521	0.47	0.475	0.00	0.949	0.01	0.109	0.12
030	0.636	0.03	0.424	0.02	2.348	1.39	0.466	0.06	0.590	0.56	0.530	0.03	1.060	0.05	0.102	0.10
031	0.680	0.06	0.227	0.02	0.561	0.18	0.057	0.01	0.340	0.03	0.567	0.05	1.133	0.10	0.057	0.01
032	0.956	0.48	0.478	0.48	0.717	0.00	0.060	0.00	0.538	0.36	0.597	0.00	1.195	0.00	0.060	0.00
033	0.433	0.05	0.216	0.02	0.535	0.16	0.054	0.01	0.325	0.04	0.541	0.06	1.082	0.12	0.054	0.01
034	0.550	0.29	0.275	0.15	0.550	0.29	0.069	0.04	0.412	0.22	0.687	0.37	1.374	0.73	0.069	0.04
035	0.470	0.02	0.235	0.01	0.821	0.21	0.088	0.06	0.353	0.01	0.588	0.02	1.176	0.04	0.089	0.06
036	0.407	0.00	0.204	0.00	0.407	0.00	0.051	0.00	0.305	0.00	0.509	0.01	1.018	0.01	0.051	0.00
037	0.294	0.18	0.197	0.01	0.294	0.18	0.049	0.00	0.296	0.01	0.493	0.02	0.986	0.04	0.049	0.00
038	0.438	0.05	0.219	0.02	0.785	0.74	0.055	0.01	0.329	0.04	0.548	0.06	1.096	0.12	0.084	0.06
039	0.389	0.01	0.194	0.00	0.485	0.19	0.049	0.00	0.292	0.00	0.486	0.01	0.972	0.02	0.092	0.09
040	0.227	0.01	0.227	0.01	0.453	0.01	0.057	0.00	0.340	0.01	0.567	0.01	1.134	0.03	0.057	0.00
041	0.707	0.05	0.236	0.02	0.707	0.05	0.059	0.00	0.353	0.03	0.589	0.04	1.178	0.09	0.102	0.09
042	0.402	0.08	0.201	0.04	0.512	0.30	0.050	0.01	0.301	0.06	0.502	0.10	1.004	0.20	0.050	0.01
043	0.880	0.15	0.689	0.23	3.132	0.22	1.071	0.23	0.689	0.23	0.490	0.03	0.980	0.05	0.108	0.03
044	0.348	0.24	0.231	0.01	0.580	0.25	0.058	0.00	0.347	0.01	0.578	0.01	1.157	0.03	0.058	0.00
045	0.630	0.03	0.312	0.19	1.659	1.60	0.324	0.54	0.315	0.02	0.525	0.03	1.050	0.05	0.078	0.05
080	5.056	0.24	0.470	0.00	2.234	0.24	0.317	0.02	3.880	1.65	0.588	0.00	4.703	0.00	0.282	0.14
081	18.708	7.66	1.279	0.57	2.838	1.21	0.215	0.13	18.806	9.34	0.701	0.16	18.395	7.03	1.571	0.61
082	5.374	0.29	0.516	0.04	1.121	0.25	0.085	0.04	5.284	0.11	0.534	0.18	5.160	0.36	0.473	0.05
083	6.915	0.75	0.461	0.02	2.754	0.81	0.393	0.15	5.998	1.17	0.576	0.02	6.910	0.29	0.552	0.02
.Mean	1.820	0.33	0.368	0.08	1.248	0.27	0.211	0.04	1.569	0.40	0.556	0.05	2.126	0.25	0.169	0.06
Std.Dev.	3.381	1.11	0.444	0.12	1.974	0.35	0.607	0.09	3.324	1.36	0.047	0.06	3.300	1.01	0.266	0.10

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 1-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.043	0.05	5.215	0.54	5.215	0.54	0.209	0.02	5.215	0.54	0.104	0.01	0.15	0.21
002	0.023	0.00	5.769	0.35	5.769	0.35	0.231	0.01	5.769	0.35	0.115	0.01	0.15	0.14
003	0.049	0.05	6.075	0.00	6.075	0.00	0.243	0.00	6.075	0.00	0.122	0.00	0.07	0.10
004	0.046	0.05	5.577	0.60	5.577	0.60	0.329	0.19	5.577	0.60	0.112	0.01	0.22	0.24
005	0.034	0.02	5.698	0.12	5.698	0.12	0.228	0.00	5.698	0.12	0.114	0.00	0.05	0.06
006	0.039	0.03	5.202	1.06	5.202	1.06	0.718	0.06	5.202	1.06	0.104	0.02	0.28	0.43
007	0.023	0.00	5.625	0.08	5.625	0.08	0.337	0.22	5.625	0.08	0.113	0.00	0.04	0.06
008	0.046	0.05	5.683	0.46	5.683	0.46	0.227	0.02	5.683	0.46	0.114	0.01	0.14	0.18
009	0.049	0.05	6.159	0.26	6.159	0.26	0.246	0.01	6.159	0.26	0.123	0.01	0.10	0.12
010	0.034	0.03	5.495	0.72	5.495	0.72	0.220	0.03	5.495	0.72	0.110	0.01	0.20	0.28
011	0.045	0.05	5.452	0.52	5.452	0.52	0.218	0.02	5.452	0.52	0.109	0.01	0.19	0.21
012	0.045	0.04	5.582	0.03	5.582	0.03	0.446	0.44	5.582	0.03	0.112	0.00	0.06	0.13
013	0.025	0.00	6.317	0.63	6.317	0.63	0.253	0.03	18.888	0.62	0.126	0.01	0.23	0.25
014	0.023	0.00	5.813	0.09	5.813	0.09	0.232	0.00	8.740	5.94	0.116	0.00	0.50	1.57
015	0.024	0.00	6.072	0.32	6.072	0.32	0.243	0.01	6.072	0.32	0.121	0.01	0.09	0.13
016	0.023	0.00	5.850	0.05	5.850	0.05	0.234	0.00	5.850	0.05	0.117	0.00	0.13	0.30
017	0.021	0.00	5.237	0.70	5.237	0.70	0.209	0.03	5.237	0.70	0.105	0.01	0.20	0.28
018	0.021	0.00	5.238	1.23	5.238	1.23	0.210	0.05	5.238	1.23	0.105	0.02	0.35	0.49
019	0.034	0.02	5.710	0.15	5.710	0.15	0.228	0.01	5.710	0.15	0.114	0.00	0.06	0.07
020	0.023	0.00	5.700	1.00	5.700	1.00	0.228	0.04	8.800	7.20	0.114	0.02	0.84	1.90
021	0.043	0.04	5.542	0.58	5.542	0.58	0.222	0.02	9.625	8.75	0.111	0.01	0.75	2.31
022	0.021	0.00	5.153	0.14	5.153	0.14	0.206	0.01	5.153	0.14	0.103	0.00	0.05	0.07
023	0.213	0.07	5.056	0.23	48.538	2.23	0.202	0.01	354.621	76.97	0.101	0.00	5.74	20.51
024	0.023	0.00	5.726	0.32	5.726	0.32	0.229	0.01	5.726	0.32	0.115	0.01	0.11	0.13
025	0.019	0.00	4.846	0.87	4.846	0.87	0.194	0.03	42.646	7.62	0.097	0.02	0.78	1.99
026	0.022	0.00	5.375	0.03	5.375	0.03	0.215	0.00	5.375	0.03	0.108	0.00	0.04	0.08
027	0.021	0.00	5.202	0.48	5.202	0.48	0.208	0.02	5.202	0.48	0.104	0.01	0.17	0.19
028	0.038	0.04	4.746	0.03	4.746	0.03	0.190	0.00	14.684	19.85	0.095	0.00	1.51	5.28
030	0.065	0.09	5.302	0.26	9.103	7.86	0.429	0.44	51.983	4.66	0.106	0.01	1.11	2.30
031	0.023	0.00	5.665	0.51	5.665	0.51	0.227	0.02	5.665	0.51	0.113	0.01	0.14	0.20
032	0.024	0.00	5.973	0.00	5.973	0.00	0.239	0.00	10.154	8.36	0.119	0.00	0.69	2.22
033	0.022	0.00	5.411	0.59	5.411	0.59	0.216	0.02	5.411	0.59	0.108	0.01	0.16	0.24
034	0.027	0.01	6.871	3.67	6.871	3.67	0.275	0.15	6.871	3.67	0.137	0.07	0.96	1.48
035	0.024	0.00	5.879	0.19	5.879	0.19	0.235	0.01	11.087	10.23	0.118	0.00	0.79	2.72
036	0.020	0.00	5.089	0.05	5.089	0.05	0.204	0.00	5.089	0.05	0.102	0.00	0.01	0.02
037	0.020	0.00	4.929	0.21	4.929	0.21	0.197	0.01	4.929	0.21	0.099	0.00	0.08	0.10
038	0.022	0.00	5.478	0.62	5.478	0.62	0.219	0.02	5.478	0.62	0.110	0.01	0.21	0.29
039	0.019	0.00	4.862	0.08	4.862	0.08	0.194	0.00	4.862	0.08	0.097	0.00	0.04	0.06
040	0.023	0.00	5.668	0.14	5.668	0.14	0.227	0.01	5.668	0.14	0.113	0.00	0.04	0.06
041	0.024	0.00	5.889	0.44	5.889	0.44	0.236	0.02	5.889	0.44	0.118	0.01	0.12	0.18
042	0.020	0.00	5.022	0.99	5.022	0.99	0.201	0.04	5.022	0.99	0.100	0.02	0.27	0.40
043	0.069	0.02	4.902	0.27	20.668	7.01	0.196	0.01	66.825	15.41	0.098	0.01	1.71	4.35
044	0.023	0.00	5.784	0.14	5.784	0.14	0.231	0.01	5.784	0.14	0.116	0.00	0.07	0.09
045	0.021	0.00	5.250	0.26	5.250	0.26	0.210	0.01	23.814	26.11	0.105	0.01	2.08	6.93
080	0.024	0.00	5.879	0.00	5.879	0.00	0.235	0.00	21.165	4.70	0.118	0.00	0.50	1.29
081	0.028	0.01	7.012	1.62	7.012	1.62	0.561	0.13	7.012	1.62	0.140	0.03	2.27	3.20
082	0.021	0.01	5.338	1.77	5.338	1.77	0.214	0.07	7.563	2.68	0.107	0.04	0.55	0.86
083	0.023	0.00	5.758	0.24	5.758	0.24	0.230	0.01	21.856	1.38	0.115	0.00	0.37	0.47
Ar.Mean	0.034	0.02	5.564	0.49	6.878	0.83	0.253	0.05	17.859	4.54	0.111	0.01	0.53	1.36
Std.dev.	0.029	0.02	0.472	0.62	6.547	1.55	0.097	0.10	51.171	11.96	0.009	0.01	0.93	3.18

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 1-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
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035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 2-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	[illegible]
001	0.412	0.18	0.122	0.08	0.657	0.02	0.165	0.07	0.246	0.01	0.410	0.02	0.821	0.03	0.148	0.01
002	0.512	0.22	0.072	0.01	0.367	0.20	0.146	0.05	0.217	0.03	0.362	0.05	0.723	0.11	0.080	0.08
003	1.301	0.60	0.327	0.01	1.551	0.10	0.506	0.05	1.061	0.12	0.409	0.02	1.634	0.06	0.358	0.15
004	0.658	0.31	0.290	0.17	0.822	0.39	0.154	0.06	0.846	0.06	0.411	0.20	0.822	0.39	0.296	0.14
005	0.691	0.22	0.225	0.13	0.844	0.24	0.214	0.02	0.844	0.24	0.382	0.04	0.763	0.08	0.203	0.33
006	0.788	0.25	0.129	0.07	0.696	0.06	0.131	0.03	0.696	0.06	0.435	0.04	0.871	0.08	0.391	0.02
007	0.187	0.20	0.080	0.02	0.621	0.19	0.040	0.01	0.239	0.05	0.398	0.08	0.796	0.16	0.101	0.03
008	0.310	0.15	0.061	0.00	0.801	0.18	0.136	0.03	0.344	0.33	0.307	0.02	0.615	0.05	0.122	0.04
009	0.332	0.04	0.200	0.22	0.753	0.26	0.163	0.08	0.249	0.03	0.415	0.05	0.830	0.11	0.115	0.02
010	0.292	0.22	0.079	0.02	0.429	0.05	0.149	0.03	0.169	0.06	0.281	0.11	0.563	0.21	0.122	0.08
011	0.118	999.99	0.236	999.99	0.589	999.99	0.236	999.99	0.177	999.99	0.295	999.99	0.589	999.99	0.601	999.99
012	0.160	0.18	0.339	0.18	1.069	0.14	0.262	0.07	0.200	0.03	0.334	0.04	0.668	0.09	0.140	0.01
013	0.279	0.25	0.357	0.09	0.636	0.34	0.594	0.10	0.268	0.07	0.446	0.12	0.892	0.23	0.045	0.01
014	0.725	0.16	0.202	0.24	0.726	0.17	0.234	0.05	0.726	0.17	0.403	0.00	0.806	0.01	0.153	0.02
015	0.312	0.02	0.078	0.00	0.468	0.03	0.039	0.00	0.234	0.01	0.390	0.02	0.779	0.05	0.039	0.00
016	1.668	0.11	0.200	0.13	1.001	0.15	0.213	0.13	1.733	0.51	0.334	0.01	2.669	0.04	0.481	0.11
017	0.473	0.11	0.114	0.05	0.316	0.08	0.039	0.01	0.410	0.29	0.394	0.09	0.789	0.19	0.064	0.04
018	1.483	0.48	0.211	0.27	0.492	0.05	0.041	0.00	1.656	0.82	0.410	0.04	1.250	0.94	0.222	0.07
019	1.970	0.34	0.268	0.18	0.627	0.17	0.107	0.00	2.237	1.23	0.448	0.00	2.233	2.67	0.170	0.12
020	4.505	0.29	0.394	0.15	0.790	0.02	0.095	0.03	4.986	1.25	0.395	0.01	5.519	1.42	0.671	0.12
021	0.542	0.20	0.077	0.01	0.769	0.07	0.057	0.03	0.231	0.02	0.385	0.04	0.769	0.07	0.132	0.06
022	0.306	0.03	0.076	0.01	0.539	0.21	0.085	0.09	0.229	0.03	0.382	0.04	0.764	0.08	0.136	[illegible]
023	1.536	0.43	1.533	0.04	4.311	0.07	1.525	0.18	1.733	1.20	0.479	0.01	1.444	1.00	0.172	[illegible]
024	0.229	0.21	0.198	0.27	0.436	0.13	0.036	0.01	0.218	0.07	0.363	0.11	0.726	0.22	0.076	[illegible]
025	0.115	0.06	0.230	0.12	0.702	0.04	0.192	0.09	0.236	0.04	0.394	0.06	0.788	0.13	0.079	0.07
026	0.088	0.00	0.088	0.00	0.437	0.17	0.044	0.00	0.262	0.00	0.438	0.00	0.875	0.01	0.074	0.06
027	0.707	0.17	0.195	0.23	0.706	0.14	0.251	0.06	0.507	0.54	0.392	0.01	0.785	0.02	0.306	0.07
028	0.189	0.22	0.076	0.00	0.533	0.13	0.038	0.00	0.229	0.01	0.382	0.01	0.764	0.03	0.107	0.03
030	0.265	0.36	0.776	0.52	2.314	0.19	1.526	0.19	0.554	0.07	0.400	0.06	0.800	0.12	0.177	0.15
031	0.410	0.02	0.206	0.14	1.505	0.33	0.247	0.12	0.479	0.16	0.342	0.01	0.683	0.03	0.158	0.05
032	0.729	0.69	0.263	0.33	0.921	0.30	0.226	0.11	1.125	0.32	0.509	0.05	1.018	0.11	0.131	0.17
033	0.073	0.01	0.177	0.20	0.653	0.09	0.094	0.04	0.219	0.02	0.364	0.03	0.729	0.06	0.071	0.07
034	0.078	0.01	0.078	0.01	0.313	0.05	0.039	0.01	0.235	0.04	0.392	0.06	0.783	0.12	0.077	0.08
035	0.147	0.09	0.099	0.01	0.395	0.02	0.049	0.00	0.296	0.02	0.494	0.03	0.988	0.05	0.049	0.00
036	0.078	0.01	0.078	0.01	0.311	0.04	0.039	0.01	0.358	0.28	0.389	0.06	0.778	0.11	0.086	0.03
037	0.128	0.08	0.086	0.01	0.256	0.16	0.043	0.00	0.392	0.28	0.431	0.03	0.861	0.06	0.043	0.00
038	0.166	0.20	0.067	0.00	0.267	0.00	0.050	0.03	0.200	0.00	0.333	0.00	0.667	0.01	0.087	0.01
039	0.896	1.26	0.203	0.27	0.455	0.11	0.038	0.01	1.199	1.33	0.379	0.09	1.181	1.02	0.152	0.17
040	0.089	0.00	0.089	0.00	0.356	0.00	0.103	0.12	0.267	0.00	0.445	0.01	0.889	0.01	0.044	0.00
041	0.075	0.00	0.075	0.00	0.375	0.16	0.037	0.00	0.224	0.01	0.374	0.01	0.747	0.03	0.072	0.07
042	0.072	0.00	0.108	0.08	0.504	0.16	0.108	0.02	0.543	0.66	0.359	0.01	0.718	0.02	0.151	0.02
043	0.522	0.24	0.295	0.05	1.406	0.40	0.267	0.08	0.938	0.27	0.368	0.07	1.071	0.54	0.348	0.05
044	0.093	0.01	0.093	0.01	0.372	0.05	0.111	0.14	0.279	0.04	0.465	0.07	0.929	0.13	0.046	0.01
045	0.127	0.08	0.128	0.09	0.846	0.31	0.162	0.06	0.255	0.01	0.424	0.01	0.849	0.03	0.153	0.00
080	2.573	0.51	0.596	0.13	2.673	1.37	0.721	0.15	2.821	0.01	0.428	0.03	3.423	0.23	0.043	0.00
081	7.090	4.50	0.872	0.40	1.429	0.10	0.458	0.24	8.489	5.68	0.359	0.05	8.048	5.34	1.070	0.31
082	3.459	0.50	0.322	0.00	0.804	0.01	0.137	0.02	4.421	1.42	0.402	0.00	4.826	0.03	0.772	0.06
083	5.096	1.17	0.530	0.28	2.277	0.54	0.886	0.63	5.656	0.72	0.454	0.07	5.304	2.76	0.409	0.72
Ar.Mean	0.897	0.33	0.242	0.11	0.857	0.18	0.234	0.07	1.044	0.40	0.395	0.04	1.393	0.41	0.203	[illegible]
Std.Dev.	1.427	0.68	0.260	0.12	0.736	0.21	0.326	0.10	1.650	0.89	0.048	0.04	1.521	0.95	0.211	[illegible]

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 2-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.016	0.00	4.104	0.15	4.104	0.15	0.164	0.01	13.164	3.77	0.082	0.00	0.32	1.00
002	0.014	0.00	3.616	0.54	3.616	0.54	0.145	0.02	8.665	10.63	0.072	0.01	0.89	2.81
003	0.016	0.00	4.086	0.16	7.694	7.06	0.163	0.01	35.188	6.24	0.082	0.00	1.04	2.39
004	0.029	0.02	4.112	1.96	4.112	1.96	0.415	0.42	6.656	7.04	0.082	0.04	0.94	1.87
005	0.015	0.00	3.817	0.40	3.817	0.40	0.153	0.02	18.402	4.98	0.076	0.01	0.51	1.30
006	0.017	0.00	4.353	0.40	4.353	0.40	0.605	0.12	15.670	1.45	0.087	0.01	0.21	0.38
007	0.016	0.00	3.978	0.78	3.978	0.78	0.159	0.03	6.490	4.25	0.080	0.02	0.47	1.12
008	0.012	0.00	3.074	0.23	3.074	0.23	0.123	0.01	17.668	7.29	0.061	0.00	0.61	1.92
009	0.017	0.00	4.152	0.54	4.152	0.54	0.477	0.60	4.152	0.54	0.083	0.01	0.22	0.23
010	0.011	0.00	2.813	1.07	2.813	1.07	0.113	0.04	14.384	8.73	0.056	0.02	0.84	2.30
011	0.012	999.99	2.946	999.99	2.946	999.99	0.118	999.99	18.857	999.99	0.059	999.99	999.99	999.99
012	0.046	0.01	3.342	0.44	3.342	0.44	0.134	0.02	30.737	24.03	0.067	0.01	1.83	6.39
013	0.048	0.07	4.461	1.16	4.461	1.16	0.178	0.05	29.405	33.98	0.089	0.02	2.69	9.01
014	0.016	0.00	4.031	0.03	4.031	0.03	0.161	0.00	12.469	16.85	0.081	0.00	1.26	4.49
015	0.016	0.00	3.897	0.24	3.897	0.24	0.156	0.01	3.897	0.24	0.078	0.00	0.06	0.10
016	0.013	0.00	3.336	0.05	3.336	0.05	0.268	0.27	3.336	0.05	0.067	0.00	0.12	0.13
017	0.016	0.00	3.944	0.94	3.944	0.94	0.158	0.04	3.944	0.94	0.079	0.02	0.27	0.37
018	0.016	0.00	4.097	0.42	4.097	0.42	0.164	0.02	4.097	0.42	0.082	0.01	0.28	0.31
019	0.018	0.00	4.479	0.04	4.479	0.04	0.179	0.00	17.042	9.12	0.090	0.00	0.99	2.45
020	0.016	0.00	3.950	0.12	3.950	0.12	0.158	0.00	7.558	7.33	0.079	0.00	0.78	1.94
021	0.015	0.00	3.847	0.36	3.847	0.36	0.154	0.01	8.500	2.33	0.077	0.01	0.26	0.61
022	0.015	0.00	3.819	0.42	3.819	0.42	0.153	0.02	3.819	0.42	0.076	0.01	0.13	0.16
023	0.163	0.01	4.792	0.14	16.250	5.28	0.192	0.01	167.278	77.67	0.096	0.00	6.15	20.63
024	0.015	0.00	3.629	1.10	3.629	1.10	0.145	0.04	3.629	1.10	0.073	0.02	0.32	0.43
025	0.023	0.01	3.938	0.64	3.938	0.64	0.158	0.03	16.811	9.77	0.079	0.01	0.84	2.58
026	0.018	0.00	4.375	0.03	4.375	0.03	0.175	0.00	4.375	0.03	0.088	0.00	0.02	0.05
027	0.016	0.00	3.924	0.08	3.924	0.08	0.157	0.00	19.564	10.59	0.078	0.00	0.86	2.80
028	0.015	0.00	3.819	0.14	3.819	0.14	0.153	0.01	8.097	8.69	0.076	0.00	0.67	2.31
030	0.126	0.04	4.000	0.61	11.200	1.71	0.160	0.02	96.739	13.19	0.080	0.01	1.23	3.47
031	0.055	0.03	3.415	0.13	3.415	0.13	0.137	0.01	27.402	9.27	0.068	0.00	0.74	2.45
032	0.031	0.02	5.089	0.54	5.089	0.54	0.311	0.24	22.500	6.43	0.102	0.01	0.70	1.66
033	0.015	0.00	3.643	0.32	3.643	0.32	0.146	0.01	20.014	15.69	0.073	0.01	1.20	4.17
034	0.016	0.00	3.917	0.61	3.917	0.61	0.157	0.02	3.917	0.61	0.078	0.01	0.16	0.25
035	0.020	0.00	4.938	0.26	4.938	0.26	0.198	0.01	4.938	0.26	0.099	0.01	0.07	0.11
036	0.016	0.00	3.889	0.56	3.889	0.56	0.156	0.02	3.889	0.56	0.078	0.01	0.16	0.23
037	0.017	0.00	4.306	0.28	4.306	0.28	0.172	0.01	4.306	0.28	0.086	0.01	0.10	0.12
038	0.013	0.00	3.335	0.03	3.335	0.03	0.133	0.00	4.996	3.29	0.067	0.00	0.26	0.88
039	0.015	0.00	3.790	0.88	3.790	0.88	0.152	0.04	3.790	0.88	0.076	0.02	0.50	0.51
040	0.018	0.00	4.446	0.05	4.446	0.05	0.178	0.00	15.145	9.07	0.089	0.00	0.67	2.42
041	0.015	0.00	3.737	0.13	3.737	0.13	0.149	0.01	6.399	5.46	0.075	0.00	0.43	1.45
042	0.014	0.00	3.589	0.11	3.589	0.11	0.144	0.00	15.793	0.47	0.072	0.00	0.12	0.20
043	0.048	0.06	3.683	0.67	6.696	5.36	0.348	0.38	23.973	13.12	0.074	0.01	1.52	3.61
044	0.029	0.02	4.647	0.67	4.647	0.67	0.186	0.03	14.009	3.87	0.093	0.01	0.41	1.02
045	0.026	0.02	4.243	0.13	4.243	0.13	0.170	0.01	11.906	3.74	0.085	0.00	0.33	0.99
080	0.120	0.01	4.279	0.28	8.004	7.17	0.171	0.01	50.521	5.03	0.086	0.01	1.07	2.20
081	0.065	0.02	3.595	0.47	3.595	0.47	0.144	0.02	34.231	4.16	0.072	0.01	1.55	2.24
082	0.032	0.03	4.022	0.03	7.653	7.29	0.161	0.00	9.233	10.40	0.080	0.00	1.41	3.23
083	0.046	0.03	4.540	0.72	8.952	9.55	0.182	0.03	48.311	10.35	0.091	0.01	1.97	3.46
.Mean	0.029	0.01	3.955	0.43	4.727	1.29	0.188	0.06	19.289	7.97	0.079	0.01	0.81	2.23
Std.dev.	0.031	0.02	0.476	0.39	2.357	2.28	0.093	0.12	27.327	12.35	0.010	0.01	0.98	3.26

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 2-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004		SCREEN MISSING	
005			
006			
007			
008	SCREEN MISSING	SCREEN MISSING	
009			
010			
011	VOID/VANDALISM		MISSING SAMPLE A
012			
013			
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081			
082			
083			

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 3-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

ocation Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
--------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------
001	1.920	0.16	0.430	0.06	1.075	0.15	0.241	0.16	2.565	0.07	0.538	0.08	1.075	0.15	0.470	0.02
002	1.938	0.23	0.570	0.23	0.912	0.00	0.319	0.09	2.280	0.00	0.570	0.00	1.140	0.00	0.467	0.02
003	2.145	0.04	0.400	0.18	1.114	0.06	0.241	0.17	2.464	0.02	0.398	0.02	1.205	0.86	0.175	0.01
004	0.788	0.42	0.196	0.01	1.075	0.15	0.166	0.05	1.271	0.14	0.490	0.02	0.980	0.04	0.205	0.05
005	0.822	0.22	0.454	0.16	0.822	0.22	0.273	0.06	1.187	0.24	0.456	0.02	0.911	0.04	0.046	0.00
006	0.993	0.09	0.365	0.10	0.810	0.04	0.180	0.01	1.175	0.14	0.457	0.12	0.914	0.25	0.185	0.09
007	0.810	0.20	0.464	0.02	1.856	0.08	0.369	0.17	1.160	0.05	0.580	0.03	1.160	0.05	0.348	0.03
008	1.056	0.28	0.428	0.06	1.171	0.05	0.273	0.19	1.071	0.14	0.535	0.07	1.071	0.14	0.300	0.04
009	1.846	0.56	0.550	0.32	1.080	0.20	0.430	0.27	1.708	0.11	0.540	0.10	1.080	0.20	0.054	0.01
010	1.543	0.06	0.164	0.10	0.882	0.04	0.186	0.10	1.764	0.07	0.551	0.02	1.103	0.04	0.285	0.12
011	1.241	999.99	0.414	999.99	1.034	999.99	0.310	999.99	1.241	999.99	0.517	999.99	1.034	999.99	0.414	999.99
012	1.150	0.31	1.729	0.52	1.810	0.35	0.633	0.01	1.233	0.15	0.411	0.01	1.231	0.81	0.345	0.00
013	0.962	0.14	1.386	1.88	1.591	0.96	0.429	0.03	1.221	0.66	0.601	0.09	1.203	0.18	0.335	0.00
014	3.278	0.10	0.545	0.20	2.837	0.35	0.468	0.18	3.492	0.33	0.546	0.02	2.185	0.07	0.446	0.18
015	0.829	0.21	0.359	0.25	1.067	0.20	0.203	0.08	1.067	0.20	0.594	0.02	1.188	0.04	0.059	0.00
016	5.769	1.38	0.674	0.01	1.415	0.11	0.284	0.13	5.611	0.00	0.380	0.09	4.555	1.09	0.678	0.07
017	1.113	0.17	0.371	0.06	0.756	0.49	0.272	0.10	1.298	0.20	0.464	0.07	0.927	0.15	0.141	0.20
018	1.539	0.08	0.275	0.20	0.907	0.06	0.191	0.07	1.720	0.07	0.453	0.03	0.907	0.06	0.398	0.01
019	1.802	0.09	1.042	0.13	3.040	0.17	0.805	0.16	1.802	0.09	0.475	0.03	0.950	0.05	0.048	0.00
020	8.069	0.33	0.800	0.05	0.934	0.05	0.221	0.05	9.274	0.67	0.334	0.02	7.357	1.76	0.881	0.05
021	1.275	0.10	0.520	0.55	1.020	0.08	0.244	0.10	1.275	0.10	0.638	0.05	1.275	0.10	0.306	0.02
022	0.937	0.47	0.235	0.00	0.820	0.23	0.141	0.05	1.172	0.00	0.586	0.00	1.172	0.00	0.223	0.12
023	1.840	0.12	4.151	2.24	13.862	3.49	4.167	2.63	1.945	0.33	0.486	0.08	1.418	0.73	0.769	0.15
024	0.705	999.99	0.235	999.99	0.705	999.99	0.235	999.99	0.940	999.99	0.587	999.99	1.175	999.99	0.282	999.99
025	0.454	0.25	0.716	0.11	2.273	1.08	0.651	0.04	0.716	0.11	0.447	0.07	0.895	0.13	0.045	0.01
026	1.293	0.55	0.647	0.27	0.905	0.28	0.232	0.05	1.418	0.22	0.645	0.02	1.290	0.03	0.258	0.01
027	0.995	0.33	0.208	0.25	0.207	0.25	0.100	0.00	1.244	0.16	0.415	0.00	0.830	0.00	0.041	0.00
028	1.080	0.20	0.332	0.01	1.991	0.05	0.274	0.01	1.161	0.03	0.415	0.01	0.830	0.02	0.423	0.06
030	1.224	0.12	0.760	0.42	2.080	0.49	0.717	0.08	1.504	0.30	0.472	0.03	0.943	0.05	0.246	0.40
031	0.893	0.05	0.265	0.16	1.072	0.06	0.204	0.11	1.250	0.07	0.447	0.03	0.893	0.05	0.313	0.07
032	1.711	0.47	2.766	1.47	13.805	5.46	2.955	1.48	1.230	0.12	0.474	0.02	0.948	0.05	0.154	0.21
033	0.818	0.18	0.364	0.00	1.091	0.36	0.209	0.09	1.000	0.18	0.455	0.00	0.909	0.00	0.141	0.19
034	0.729	0.03	0.181	0.11	0.848	0.21	0.146	0.01	1.210	0.44	0.607	0.03	1.215	0.05	0.243	0.01
035	0.983	0.39	0.557	0.07	0.966	0.16	0.192	0.09	1.376	0.39	0.696	0.08	1.392	0.17	0.278	0.03
036	0.996	0.03	0.186	0.12	0.625	0.27	0.094	0.07	1.241	0.46	0.623	0.02	1.245	0.04	0.236	0.02
037	0.995	0.46	0.186	0.12	0.500	0.02	0.125	0.00	1.123	0.21	0.625	0.02	1.250	0.05	0.162	0.02
038	1.055	0.07	0.193	0.02	0.964	0.11	0.184	0.04	1.145	0.25	0.482	0.05	0.964	0.11	0.145	0.20
039	0.977	0.21	0.126	0.10	0.668	0.41	0.132	0.02	1.152	0.14	0.411	0.05	0.823	0.10	0.107	0.14
040	0.859	0.44	0.534	0.20	0.857	0.02	0.343	0.01	0.321	0.01	0.535	0.01	1.071	0.02	0.054	0.00
041	1.217	0.20	0.331	0.22	1.109	0.46	0.254	0.11	1.549	0.42	0.554	0.01	1.108	0.02	0.410	0.07
042	1.149	0.25	0.262	0.16	0.705	0.04	0.176	0.01	1.235	0.08	0.441	0.03	0.882	0.05	0.125	0.16
043	0.855	0.02	0.298	0.25	1.020	1.35	0.173	0.04	1.346	0.27	0.481	0.10	0.961	0.20	0.048	0.01
044	0.638	0.03	0.106	0.01	0.638	0.03	0.117	0.02	0.959	0.26	0.531	0.03	1.063	0.06	0.080	0.06
045	0.989	0.16	0.451	0.19	1.620	0.03	0.270	0.04	1.169	0.16	0.450	0.01	0.900	0.02	0.413	0.10
080	5.954	0.14	1.079	0.48	11.388	2.45	1.768	0.98	5.672	0.43	0.445	0.05	3.564	0.40	0.247	0.04
081	11.593	3.95	1.097	0.11	1.910	0.06	0.498	0.13	13.355	0.47	0.317	0.11	10.445	0.02	0.940	0.63
082	1.908	0.08	0.244	0.13	0.665	0.09	0.189	0.06	2.152	0.05	0.416	0.05	0.832	0.11	0.185	0.28
083	4.849	0.38	0.520	0.04	2.764	0.13	0.398	0.00	5.660	2.32	0.433	0.03	4.295	1.39	0.407	0.38
r.Mean	1.846	0.32	0.608	0.27	1.943	0.47	0.452	0.18	2.086	0.25	0.500	0.04	1.599	0.22	0.283	0.09
Std.Dev.	2.080	0.59	0.700	0.45	2.968	0.99	0.718	0.45	2.301	0.35	0.085	0.03	1.757	0.38	0.209	0.13

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.022	0.00	5.375	0.75	5.375	0.75	0.215	0.03	18.800	17.60	0.108	0.02	1.43	4.66
002	0.023	0.00	5.700	0.00	5.700	0.00	0.570	0.23	27.360	13.68	0.114	0.00	1.03	3.64
003	0.016	0.00	3.977	0.23	3.977	0.23	0.159	0.01	19.182	7.45	0.080	0.00	0.66	1.97
004	0.020	0.00	4.898	0.20	4.898	0.20	0.196	0.01	31.100	22.20	0.098	0.00	1.68	5.91
005	0.018	0.00	4.557	0.20	4.557	0.20	0.182	0.01	17.214	8.34	0.091	0.00	0.69	2.20
006	0.018	0.00	4.568	1.23	4.568	1.23	0.524	0.22	13.036	7.09	0.091	0.02	0.76	1.87
007	0.023	0.00	5.800	0.25	5.800	0.25	0.232	0.01	63.825	5.07	0.116	0.01	0.44	1.33
008	0.021	0.00	5.353	0.72	5.353	0.72	0.214	0.03	20.785	31.59	0.107	0.01	2.43	8.39
009	0.022	0.00	5.400	1.00	5.400	1.00	0.216	0.04	47.920	17.44	0.108	0.02	1.52	4.59
010	0.033	0.02	5.513	0.22	5.513	0.22	0.221	0.01	15.773	20.30	0.110	0.00	1.52	5.40
011	0.021	999.99	5.172	999.99	5.172	999.99	0.207	999.99	33.103	999.99	0.103	999.99	999.99	999.99
012	0.327	0.52	4.112	0.05	7.009	5.84	1.555	2.45	64.138	2.48	0.082	0.00	0.96	1.63
013	0.076	0.11	6.013	0.91	11.832	12.54	0.758	1.07	35.690	26.90	0.120	0.02	3.25	7.54
014	0.043	0.04	5.462	0.17	15.295	0.49	0.326	0.21	29.235	31.83	0.109	0.00	2.44	8.46
015	0.024	0.00	5.938	0.22	5.938	0.22	0.238	0.01	18.643	25.64	0.119	0.00	1.94	6.82
016	0.015	0.00	3.795	0.91	3.795	0.91	0.389	0.24	23.927	0.25	0.076	0.02	0.37	0.48
017	0.019	0.00	4.636	0.73	4.636	0.73	0.185	0.03	25.509	31.02	0.093	0.01	2.43	8.23
018	0.018	0.00	4.534	0.30	4.534	0.30	0.181	0.01	9.684	10.60	0.091	0.01	0.84	2.81
019	0.019	0.00	4.750	0.27	13.300	0.76	0.190	0.01	80.668	1.06	0.095	0.01	0.20	0.32
020	0.013	0.00	3.335	0.19	3.335	0.19	0.133	0.01	12.770	7.40	0.067	0.00	0.77	1.97
021	0.052	0.06	6.375	0.50	6.375	0.50	0.775	0.57	48.950	29.30	0.128	0.01	2.29	7.78
022	0.023	0.00	5.862	0.02	5.862	0.02	0.235	0.00	8.800	5.90	0.117	0.00	0.49	1.56
023	0.310	0.01	4.864	0.82	58.291	31.05	0.195	0.03	355.091	175.64	0.097	0.02	15.52	46.79
024	0.023	999.99	5.875	999.99	5.875	999.99	0.235	999.99	23.500	999.99	0.118	999.99	999.99	999.99
025	0.051	0.06	4.474	0.67	10.681	11.74	0.179	0.03	59.772	19.49	0.089	0.01	2.41	5.80
026	0.104	0.16	6.450	0.15	6.450	0.15	0.519	0.53	20.640	0.48	0.129	0.00	0.21	0.19
027	0.017	0.00	4.148	0.02	7.891	7.51	0.166	0.00	12.882	17.49	0.083	0.00	1.86	4.92
028	0.017	0.00	4.148	0.11	4.148	0.11	0.166	0.00	21.591	3.91	0.083	0.00	0.32	1.03
030	0.046	0.05	4.716	0.25	8.848	8.01	0.189	0.01	52.818	2.80	0.094	0.01	0.93	2.16
031	0.018	0.00	4.466	0.25	4.466	0.25	0.179	0.01	25.727	11.05	0.089	0.01	0.87	2.93
032	0.200	0.11	4.739	0.25	62.027	35.47	0.287	0.20	240.105	181.25	0.095	0.00	16.18	48.42
033	0.018	0.00	4.545	0.00	8.636	8.18	0.182	0.00	14.545	10.91	0.091	0.00	1.44	3.48
034	0.024	0.00	6.075	0.25	6.075	0.25	0.243	0.01	12.620	12.84	0.122	0.01	1.02	3.41
035	0.028	0.00	6.962	0.83	6.962	0.83	0.278	0.03	14.167	13.58	0.139	0.02	1.19	3.58
036	0.025	0.00	6.225	0.20	6.225	0.20	0.249	0.01	6.225	0.20	0.125	0.00	0.12	0.13
037	0.025	0.00	6.250	0.25	6.250	0.25	0.250	0.01	6.250	0.25	0.125	0.00	0.12	0.14
038	0.019	0.00	4.818	0.55	4.818	0.55	0.193	0.02	4.818	0.55	0.096	0.01	0.18	0.21
039	0.016	0.00	4.114	0.50	4.114	0.50	0.165	0.02	6.295	4.86	0.082	0.01	0.50	1.27
040	0.021	0.00	5.353	0.10	5.353	0.10	0.214	0.00	40.748	13.63	0.107	0.00	1.04	3.63
041	0.022	0.00	5.538	0.08	5.538	0.08	0.221	0.00	10.487	9.82	0.111	0.00	0.82	2.60
042	0.018	0.00	4.409	0.27	4.409	0.27	0.176	0.01	10.818	12.55	0.088	0.01	0.99	3.33
043	0.019	0.00	4.807	0.98	4.807	0.98	0.192	0.04	12.750	16.86	0.096	0.02	1.51	4.44
044	0.021	0.00	5.315	0.28	5.315	0.28	0.213	0.01	5.315	0.28	0.106	0.01	0.10	0.12
045	0.018	0.00	4.500	0.09	4.500	0.09	0.180	0.00	22.473	4.95	0.090	0.00	0.42	1.30
080	0.037	0.04	4.455	0.50	45.286	0.25	0.178	0.02	121.423	54.48	0.089	0.01	4.30	14.46
081	0.013	0.00	3.170	1.11	3.170	1.11	0.127	0.04	35.064	7.40	0.063	0.02	1.08	2.10
082	0.017	0.00	4.159	0.55	4.159	0.55	0.166	0.02	10.759	0.25	0.083	0.01	0.16	0.18
083	0.017	0.00	4.330	0.34	12.123	0.95	0.173	0.01	38.727	9.05	0.087	0.01	1.08	2.39
Ar.Mean	0.042	0.03	5.001	0.40	9.263	2.98	0.279	0.14	38.578	19.73	0.100	0.01	1.79	5.36
Std.dev.	0.066	0.08	0.845	0.33	12.392	7.22	0.236	0.40	60.128	35.99	0.017	0.01	3.16	9.57

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006		SCREEN MISSING	
007			
008			
009		SCREEN MISSING	
010			
011	VOID/CONTAINER ON GROUND		MISSING SAMPLE A
012	SCREEN MISSING		
013			
014			
015			
016			
017			
018			
019			
020			
021	SAND ON SCREEN		
022			
023			
024		VOID/CONTAINER ON GROUND	MISSING SAMPLE B
025		SAND ON SCREEN	
026			
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039		SCREEN MISSING	
040			
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044			
045			
080	SAND ON SCREEN	SAND ON SCREEN	
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 4-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	1.175	0.18	0.259	0.02	0.620	0.25	0.263	0.09	1.117	0.07	0.123	0.09	0.802	0.25	0.018	0.00
002	0.855	0.29	0.581	0.74	0.609	0.06	0.249	0.07	1.165	0.20	0.155	0.05	0.882	0.35	0.145	0.01
003	1.310	0.44	0.583	0.47	1.004	0.06	0.346	0.02	1.089	0.32	0.155	0.04	0.620	0.15	0.041	0.05
004	0.938	0.30	1.063	1.14	0.635	0.09	0.281	0.13	0.518	0.05	0.293	0.09	0.586	0.19	0.029	0.01
005	0.952	0.00	0.096	0.05	0.508	0.30	0.171	0.13	0.531	0.11	0.240	0.11	0.481	0.23	0.045	0.05
006	0.568	0.13	0.227	0.05	0.555	0.10	0.153	0.08	0.682	0.16	0.284	0.07	0.568	0.13	0.091	0.02
007	0.235	999.99	0.117	999.99	0.469	999.99	0.141	999.99	0.235	999.99	0.147	999.99	0.293	999.99	0.015	999.99
008	0.351	0.04	0.165	0.00	0.599	0.20	0.192	0.12	0.434	0.03	0.156	0.11	0.311	0.21	0.023	0.00
009	0.723	0.09	0.212	0.04	0.925	0.30	0.256	0.01	0.800	0.24	0.217	0.05	0.434	0.10	0.022	0.00
010	0.955	999.99	0.255	999.99	0.700	999.99	0.267	999.99	1.018	999.99	0.159	999.99	0.636	999.99	0.038	999.99
011	0.422	999.99	0.230	999.99	0.653	999.99	0.353	999.99	0.461	999.99	0.096	999.99	0.192	999.99	0.010	999.99
012	0.332	0.06	0.392	0.01	1.251	0.27	0.539	0.05	0.518	0.18	0.049	0.01	0.388	0.09	0.140	0.04
013	0.293	0.11	0.311	0.30	1.217	0.12	0.391	0.10	0.431	0.06	0.244	0.09	0.489	0.18	0.024	0.01
014	1.295	0.18	0.238	0.17	1.484	0.20	0.277	0.15	1.760	0.10	0.196	0.01	1.568	0.12	0.095	0.15
015	0.251	999.99	0.167	999.99	0.502	999.99	0.176	999.99	0.125	999.99	0.209	999.99	0.418	999.99	0.021	999.99
016	1.092	999.99	0.236	999.99	0.649	999.99	0.325	999.99	1.534	999.99	0.074	999.99	0.885	999.99	0.007	999.99
017	0.275	0.10	0.126	0.07	0.407	0.01	0.156	0.01	0.275	0.10	0.158	0.09	0.316	0.18	0.016	0.01
018	0.488	0.01	0.207	0.17	0.523	0.31	0.194	0.07	0.543	0.02	0.137	0.03	0.396	0.18	0.046	0.01
019	0.866	0.08	0.330	0.17	0.619	0.09	0.301	0.21	0.866	0.08	0.206	0.00	0.413	0.00	0.021	0.00
020	4.102	2.04	0.312	0.20	0.682	0.13	0.305	0.12	3.823	0.25	0.262	0.01	3.142	0.12	0.026	0.00
021	0.306	0.12	0.153	0.06	0.505	0.09	0.160	0.00	0.367	0.00	0.134	0.04	0.268	0.08	0.013	0.00
022	0.250	0.04	0.137	0.00	0.546	0.02	0.182	0.04	0.273	0.01	0.142	0.05	0.283	0.10	0.043	[illegible]
023	0.787	0.34	3.092	1.67	11.151	2.61	4.765	2.35	0.544	0.06	0.248	0.02	0.496	0.03	0.099	[illegible]
024	0.326	0.17	0.183	0.04	0.475	0.14	0.187	0.05	0.231	0.22	0.186	0.03	0.373	0.06	0.044	0.05
025	0.389	0.05	0.901	0.03	3.151	0.15	1.646	0.38	0.467	0.11	0.122	0.02	0.360	0.20	0.099	0.09
026	0.392	0.00	0.131	0.00	0.490	0.07	0.114	0.01	0.424	0.07	0.163	0.00	0.326	0.00	0.034	0.04
027	0.508	999.99	0.203	999.99	0.915	999.99	0.203	999.99	0.712	999.99	0.254	999.99	0.508	999.99	0.025	999.99
028	0.176	0.12	0.235	0.23	1.028	0.40	0.226	0.16	0.235	0.12	0.147	0.00	0.294	0.00	0.037	0.04
030	0.535	999.99	0.765	999.99	1.988	999.99	0.612	999.99	0.535	999.99	0.191	999.99	0.382	999.99	0.046	999.99
031	0.279	0.10	0.174	0.02	0.575	0.06	0.185	0.04	0.370	0.08	0.126	0.02	0.251	0.05	0.037	0.02
032	0.508	0.14	0.635	0.17	2.849	0.64	0.826	0.05	0.436	0.01	0.318	0.09	0.635	0.17	0.032	0.01
033	0.484	0.44	0.808	1.19	0.721	0.28	0.259	0.11	0.328	0.13	0.164	0.06	0.328	0.13	0.016	0.01
034	0.357	999.99	0.214	999.99	0.572	999.99	0.193	999.99	0.214	999.99	0.179	999.99	0.357	999.99	0.036	999.99
035	0.311	0.18	0.261	0.08	0.732	0.15	0.240	0.08	0.284	0.24	0.263	0.02	0.526	0.05	0.026	0.00
036	0.169	0.05	0.149	0.04	0.319	0.01	0.100	0.03	0.121	0.05	0.111	0.10	0.222	0.20	0.024	0.02
037	0.200	0.07	0.161	0.01	0.363	0.10	0.097	0.00	0.281	0.07	0.201	0.01	0.403	0.02	0.020	0.00
038	0.119	0.03	0.119	0.03	0.409	0.02	0.135	0.03	0.106	0.05	0.099	0.06	0.197	0.13	0.022	0.03
039	0.174	0.14	0.301	0.26	0.965	0.28	0.223	0.14	0.240	0.14	0.120	0.07	0.240	0.14	0.069	0.07
040	0.335	0.01	0.669	0.21	1.172	0.09	0.379	0.17	0.446	0.01	0.279	0.00	0.558	0.01	0.028	0.00
041	0.629	0.22	0.137	0.04	0.496	0.04	0.120	0.03	0.576	0.12	0.138	0.01	0.408	0.24	0.091	0.01
042	0.133	0.01	0.067	0.00	0.365	0.05	0.093	0.02	0.117	0.04	0.109	0.11	0.219	0.21	0.027	0.02
043	0.361	0.14	0.330	0.08	0.949	0.41	0.411	0.17	0.409	0.05	0.198	0.09	0.396	0.17	0.020	0.01
044	0.244	0.13	0.283	0.21	0.462	0.15	0.227	0.15	0.411	0.10	0.208	0.03	0.417	0.06	0.054	0.06
045	0.255	0.02	0.412	0.16	1.152	0.21	0.417	0.13	0.319	0.02	0.160	0.01	0.319	0.02	0.016	0.00
080	3.160	1.04	0.365	0.07	3.535	0.19	0.959	0.64	2.465	0.13	0.238	0.07	1.900	0.60	0.024	0.01
081	3.796	1.89	0.296	0.04	1.187	0.07	0.287	0.10	3.131	0.18	0.107	0.02	2.795	0.85	0.164	0.19
082	1.795	0.59	0.264	0.10	0.741	0.02	0.291	0.05	1.588	0.04	0.265	0.01	1.594	1.10	0.077	0.10
083	3.128	0.36	0.455	0.12	1.916	0.09	0.710	0.04	3.170	0.35	0.252	0.01	3.025	0.15	0.025	0.00
Ar.Mean	0.783	0.26	0.375	0.21	1.132	0.22	0.408	0.16	0.765	0.11	0.181	0.05	0.665	0.18	0.044	[illegible]
Std.Dev.	0.924	0.44	0.458	0.36	1.633	0.41	0.695	0.37	0.831	0.09	0.063	0.04	0.700	0.22	0.037	0.04

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 4-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

cation Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.008	0.01	1.233	0.92	1.928	0.47	0.049	0.04	19.402	0.48	0.025	0.02	0.21	0.26
002	0.014	0.01	1.545	0.45	2.732	1.92	0.141	0.14	16.673	3.56	0.031	0.01	0.56	1.00
003	0.006	0.00	1.550	0.38	4.340	1.05	0.062	0.02	29.590	14.49	0.031	0.01	1.25	3.82
004	0.012	0.00	2.931	0.94	2.931	0.94	0.117	0.04	27.758	31.02	0.059	0.02	2.50	8.22
005	0.010	0.00	2.403	1.14	2.403	1.14	0.096	0.05	14.378	4.98	0.048	0.02	0.59	1.32
006	0.011	0.00	2.840	0.65	2.840	0.65	0.114	0.03	16.667	27.00	0.057	0.01	2.08	7.18
007	0.006	999.99	1.467	999.99	1.467	999.99	0.059	999.99	18.190	999.99	0.029	999.99	999.99	999.99
008	0.014	0.01	1.555	1.06	2.478	0.79	0.165	0.16	17.305	16.27	0.031	0.02	1.36	4.30
009	0.013	0.01	2.170	0.50	2.170	0.50	0.087	0.02	22.873	10.41	0.043	0.01	0.88	2.75
010	0.006	999.99	1.591	999.99	1.591	999.99	0.064	999.99	17.182	999.99	0.032	999.99	999.99	999.99
011	0.004	999.99	0.960	999.99	2.687	999.99	0.038	999.99	36.847	999.99	0.019	999.99	999.99	999.99
012	0.024	0.02	0.485	0.11	4.271	0.97	0.306	0.01	58.434	0.13	0.026	0.03	0.14	0.25
013	0.010	0.00	2.443	0.89	2.443	0.89	0.098	0.04	32.951	1.17	0.049	0.02	0.28	0.39
014	0.012	0.01	1.960	0.15	5.489	0.41	0.116	0.07	22.332	0.90	0.039	0.00	0.19	0.23
015	0.008	999.99	2.091	999.99	2.091	999.99	0.084	999.99	8.364	999.99	0.042	999.99	999.99	999.99
016	0.003	999.99	0.737	999.99	2.950	999.99	0.030	999.99	25.370	999.99	0.015	999.99	999.99	999.99
017	0.006	0.00	1.579	0.88	1.579	0.88	0.063	0.04	17.985	0.42	0.032	0.02	0.20	0.31
018	0.010	0.01	1.373	0.33	1.373	0.33	0.055	0.01	19.072	2.50	0.027	0.01	0.28	0.65
019	0.012	0.01	2.063	0.01	2.063	0.01	0.083	0.00	29.327	27.40	0.041	0.00	2.00	7.31
020	0.010	0.00	2.618	0.10	2.618	0.10	0.105	0.00	24.678	8.24	0.052	0.00	0.81	2.20
021	0.005	0.00	1.340	0.39	1.340	0.39	0.054	0.02	18.529	2.19	0.027	0.01	0.24	0.58
022	0.006	0.00	1.417	0.52	1.417	0.52	0.080	0.03	13.703	5.95	0.028	0.01	0.52	1.57
023	0.084	0.02	2.480	0.17	36.910	14.32	0.099	0.01	374.565	113.13	0.050	0.00	9.62	30.03
024	0.007	0.00	1.864	0.32	1.864	0.32	0.075	0.01	17.550	3.74	0.037	0.01	0.37	0.98
025	0.062	0.05	1.224	0.15	11.232	0.44	0.187	0.27	161.426	62.56	0.024	0.00	4.61	16.68
026	0.007	0.00	1.632	0.00	1.632	0.00	0.131	0.13	13.712	1.31	0.033	0.00	0.11	0.34
027	0.010	999.99	2.542	999.99	2.542	999.99	0.102	999.99	61.000	999.99	0.051	999.99	999.99	999.99
028	0.006	0.00	1.470	0.01	4.115	0.03	0.059	0.00	19.403	1.34	0.029	0.00	0.18	0.35
030	0.023	999.99	1.911	999.99	7.645	999.99	0.076	999.99	59.632	999.99	0.038	999.99	999.99	999.99
031	0.005	0.00	1.256	0.24	1.256	0.24	0.050	0.01	21.190	0.52	0.025	0.00	0.10	0.14
032	0.038	0.01	3.175	0.85	12.700	3.40	0.199	0.18	125.950	64.90	0.064	0.02	5.04	17.25
033	0.007	0.00	1.638	0.63	3.393	4.14	0.066	0.03	30.380	14.12	0.033	0.01	1.52	3.79
034	0.007	999.99	1.787	999.99	1.787	999.99	0.071	999.99	18.582	999.99	0.036	999.99	999.99	999.99
035	0.011	0.00	2.631	0.23	2.631	0.23	0.105	0.01	32.294	11.86	0.053	0.00	0.94	3.14
036	0.009	0.01	1.108	1.00	1.108	1.00	0.081	0.03	14.449	3.13	0.022	0.02	0.41	0.86
037	0.008	0.00	2.013	0.10	2.013	0.10	0.081	0.00	14.885	0.07	0.040	0.00	0.04	0.04
038	0.004	0.00	0.986	0.64	1.585	0.56	0.039	0.03	11.869	0.75	0.020	0.01	0.17	0.26
039	0.017	0.03	1.198	0.68	1.971	0.87	0.202	0.33	20.608	5.49	0.024	0.01	0.62	1.42
040	0.011	0.00	2.790	0.04	2.790	0.04	0.112	0.00	48.022	7.46	0.056	0.00	0.58	1.98
041	0.006	0.00	1.379	0.11	1.379	0.11	0.110	0.01	13.390	4.99	0.028	0.00	0.42	1.32
042	0.006	0.00	1.095	1.05	1.606	0.03	0.078	0.03	8.923	4.20	0.022	0.02	0.41	1.12
043	0.022	0.03	1.978	0.86	1.978	0.86	0.175	0.23	38.700	8.07	0.040	0.02	0.80	2.11
044	0.043	0.07	2.085	0.31	2.085	0.31	0.238	0.30	25.169	14.51	0.042	0.01	1.17	3.84
045	0.006	0.00	1.597	0.12	4.471	0.34	0.064	0.00	49.916	8.88	0.032	0.00	0.71	2.35
080	0.010	0.00	2.375	0.75	13.400	0.40	0.095	0.03	76.850	6.30	0.048	0.01	0.73	1.64
081	0.004	0.00	1.069	0.16	3.683	1.84	0.043	0.01	25.590	8.86	0.021	0.00	1.01	2.35
082	0.011	0.00	2.646	0.07	2.646	0.07	0.106	0.00	33.728	20.28	0.053	0.00	1.60	5.38
083	0.010	0.00	2.521	0.13	15.000	9.33	0.101	0.01	55.483	4.77	0.050	0.00	1.10	2.68
.Mean	0.013	0.01	1.808	0.45	4.138	1.27	0.100	0.06	39.185	13.21	0.037	0.01	1.16	3.56
Std.dev.	0.015	0.01	0.632	0.36	5.795	2.65	0.055	0.09	56.940	21.80	0.012	0.01	1.75	5.77

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007	VOID/POSSIBLE CONTAMINATION	BIRD DROPPINGS ON SCREEN	MISSING SAMPLE A
008		SCREEN MISSING	
009			
010		VOID/CONTAINER EMPTY	MISSING SAMPLE B
011	VOID/CONTAINER OUT OF STAND-EMPTY		MISSING SAMPLE A
012	SCREEN IN CONTAINER	SCREEN MISSING	
013			
014		BIRD DROPPINGS ON SCREEN	
015		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
016		VOID/CONTAINER EMPTY	MISSING SAMPLE B
017			
018			
019			
020			
021	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
022			
023	LIQUID CLOUDY	LIQUID CLOUDY	
024			
025			
026		BIRD DROPPINGS ON SCREEN	
027	LIQUID GREEN	VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
028			
030	VOID/VANDALISM		MISSING SAMPLE A
031			
032			
033			
034		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
035			
036		SCREEN MISSING	
037			
038			
039			
040			
041			
042			
043		BIRD DROPPINGS ON SCREEN	
044			
045			
080			
081	BIRD DROPPINGS ON SCREEN		
082		LIQUID GREEN	
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 5-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.958	0.09	0.137	0.11	1.019	0.14	0.228	0.11	1.308	0.28	0.152	0.11	0.798	0.08	0.015	0.01
002	0.884	0.01	0.169	0.01	0.928	0.08	0.233	0.06	1.178	0.07	0.211	0.02	0.624	0.37	0.021	0.00
003	1.019	0.13	0.235	0.12	1.014	0.06	0.350	0.01	1.205	0.15	0.232	0.03	0.927	0.12	0.023	0.00
004	0.273	0.16	0.174	0.17	0.819	0.05	0.390	0.13	0.371	0.04	0.191	0.06	0.382	0.11	0.040	0.04
005	0.271	0.06	0.156	0.01	0.620	0.12	0.230	0.08	0.349	0.06	0.194	0.01	0.389	0.02	0.019	0.00
006	0.321	0.24	0.124	0.05	0.617	0.24	0.189	0.08	0.384	0.03	0.154	0.06	0.309	0.12	0.032	0.04
007	0.357	0.06	0.093	0.03	0.730	0.07	0.235	0.05	0.373	0.13	0.233	0.08	0.466	0.16	0.023	0.01
008	0.596	0.22	0.155	0.11	0.581	0.05	0.263	0.14	0.736	0.06	0.213	0.08	0.426	0.16	0.021	0.01
009	1.094	0.13	0.230	0.00	1.094	0.13	0.374	0.02	1.325	0.13	0.288	0.00	0.576	0.01	0.029	0.00
010	0.461	0.07	0.139	0.03	0.720	0.05	0.237	0.15	0.759	0.03	0.204	0.21	0.504	0.24	0.025	0.01
011	0.403	0.17	0.217	0.06	1.105	0.57	0.345	0.16	0.602	0.06	0.181	0.05	0.362	0.09	0.028	0.03
012	0.338	0.31	0.215	0.07	0.737	0.10	0.311	0.10	0.689	0.29	0.090	0.12	0.376	0.15	0.031	0.00
013	0.172	0.19	0.106	0.06	0.922	0.29	0.287	0.20	0.616	0.17	0.264	0.14	0.722	0.11	0.026	0.01
014	1.667	0.28	0.336	0.29	1.775	0.31	0.582	0.40	1.845	0.32	0.270	0.06	1.255	1.30	0.082	0.03
015	0.177	0.00	0.147	0.06	0.677	0.07	0.214	0.12	0.397	0.09	0.184	0.08	0.368	0.15	0.018	0.01
016	1.332	0.16	0.137	0.09	0.761	0.07	0.204	0.03	1.827	0.01	0.095	0.04	1.294	0.14	0.113	0.06
017	0.288	0.08	0.096	0.03	0.741	0.49	0.195	0.04	0.281	0.31	0.240	0.07	0.481	0.13	0.024	0.01
018	0.238	0.05	0.137	0.01	0.490	0.03	0.295	0.02	0.317	0.06	0.144	0.07	0.288	0.14	0.041	0.06
019	0.303	0.11	0.162	0.01	0.610	0.11	0.234	0.05	0.507	0.02	0.153	0.11	0.307	0.22	0.049	0.02
020	2.052	0.01	0.185	0.11	0.560	0.03	0.187	0.02	2.643	0.04	0.156	0.01	2.170	0.50	0.071	0.01
021	0.404	0.17	0.162	0.07	0.711	0.15	0.278	0.03	0.500	0.02	0.202	0.09	0.404	0.17	0.031	0.01
022	0.248	0.15	0.167	0.01	0.628	0.13	0.245	0.06	0.418	0.03	0.209	0.02	0.418	0.03	0.021	0.00
023	0.990	999.99	3.094	999.99	14.850	999.99	0.817	999.99	2.228	999.99	0.309	999.99	0.619	999.99	0.087	999.99
024	0.369	0.07	0.241	0.16	0.707	0.12	0.460	0.42	0.446	0.08	0.119	0.17	0.411	0.01	0.028	0.02
025	0.147	0.11	0.185	0.17	0.612	0.21	0.257	0.15	0.143	0.02	0.239	0.03	0.478	0.06	0.024	0.00
026	0.227	0.06	0.108	0.04	0.672	0.04	0.228	0.04	0.401	0.11	0.190	0.05	0.379	0.10	0.052	0.00
027	0.157	0.06	0.146	0.04	0.961	0.09	0.286	0.09	0.344	0.06	0.131	0.05	0.261	0.11	0.013	0.01
028	0.057	0.05	0.115	0.11	0.895	0.05	0.218	0.05	0.187	0.12	0.182	0.05	0.364	0.11	0.038	0.04
030	0.518	0.13	0.522	0.08	2.184	0.88	1.207	0.32	0.967	0.17	0.057	0.02	0.549	0.03	0.114	0.18
031	0.186	0.30	0.200	0.10	0.630	0.09	0.361	0.03	0.317	0.03	0.198	0.02	0.396	0.04	0.030	0.02
032	0.218	0.12	0.542	0.34	1.620	0.09	1.087	0.84	0.509	0.09	0.215	0.03	0.430	0.07	0.055	0.02
033	0.056	0.05	0.369	0.08	0.921	0.03	0.457	0.09	0.340	0.02	0.176	0.06	0.352	0.12	0.018	0.01
034	0.067	0.08	0.138	0.07	0.571	0.12	0.170	0.02	0.328	0.03	0.202	0.12	0.404	0.24	0.020	0.01
035	0.165	0.18	0.564	0.36	0.946	0.40	0.505	0.09	0.319	0.26	0.346	0.05	0.691	0.11	0.035	0.01
036	0.090	0.00	0.135	0.09	0.542	0.02	0.144	0.03	0.361	0.01	0.226	0.01	0.451	0.01	0.034	0.02
037	0.078	0.07	0.156	0.13	0.456	0.20	0.213	0.18	0.234	0.20	0.250	0.06	0.501	0.11	0.025	0.01
038	0.044	0.00	0.132	0.09	0.523	0.33	0.230	0.06	0.176	0.09	0.163	0.10	0.327	0.21	0.016	0.01
039	0.046	0.05	0.134	0.01	0.601	0.35	0.201	0.04	0.226	0.11	0.141	0.07	0.283	0.14	0.030	0.02
040	0.053	0.01	0.310	0.18	0.737	0.08	0.336	0.01	0.282	0.23	0.263	0.03	0.526	0.06	0.026	0.00
041	0.326	0.08	0.156	0.07	0.778	0.03	0.230	0.01	0.561	0.02	0.136	0.03	0.272	0.07	0.058	0.01
042	0.078	0.01	0.136	0.03	0.505	0.11	0.254	0.09	0.196	0.02	0.098	0.01	0.196	0.02	0.023	0.01
043	0.280	999.99	0.373	999.99	1.678	999.99	0.653	999.99	0.559	999.99	0.233	999.99	0.466	999.99	0.023	999.99
044	0.184	0.15	0.283	0.12	0.699	0.06	0.414	0.11	0.332	0.11	0.123	0.03	0.246	0.06	0.020	0.01
045	0.246	0.11	0.310	0.02	3.814	0.94	0.720	0.19	0.360	0.08	0.205	0.09	0.410	0.18	0.084	0.05
080	1.658	0.10	0.227	0.00	2.056	0.39	0.506	0.11	2.491	0.24	0.088	0.05	1.793	0.01	0.105	0.07
081	2.150	0.17	0.187	0.00	0.895	0.07	0.222	0.04	3.151	0.41	0.092	0.05	2.237	0.19	0.194	0.01
082	0.952	0.15	0.151	0.01	0.691	0.06	0.244	0.02	1.180	0.01	0.156	0.05	0.883	0.30	0.110	0.06
083	2.125	0.02	0.285	0.04	1.947	0.33	0.598	0.25	2.872	0.31	0.206	0.03	2.468	0.40	0.163	0.11
r.Mean	0.528	0.11	0.268	0.08	1.236	0.18	0.357	0.12	0.795	0.11	0.188	0.06	0.630	0.16	0.046	0.02
Std.Dev.	0.580	0.08	0.431	0.08	2.093	0.21	0.225	0.14	0.769	0.10	0.061	0.04	0.525	0.20	0.039	0.03

ARIZONA PUBLIC SERVICE
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AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.006	0.00	1.520	1.14	4.827	2.05	0.061	0.05	18.589	5.42	0.030	0.02	0.69	1.48
002	0.008	0.00	2.109	0.17	2.109	0.17	0.084	0.01	23.660	3.64	0.042	0.00	0.33	0.96
003	0.034	0.05	2.317	0.29	4.535	4.73	0.191	0.21	35.041	1.08	0.046	0.01	0.50	1.25
004	0.017	0.02	1.912	0.57	3.375	2.35	0.142	0.11	31.285	11.53	0.038	0.01	1.10	3.06
005	0.008	0.00	1.944	0.11	1.944	0.11	0.078	0.00	24.215	9.17	0.039	0.00	0.70	2.44
006	0.006	0.00	1.544	0.59	1.544	0.59	0.062	0.02	19.760	7.52	0.049	0.05	0.69	1.98
007	0.013	0.00	2.330	0.80	2.330	0.80	0.093	0.03	20.475	3.79	0.047	0.02	0.43	1.00
008	0.012	0.00	2.129	0.78	2.129	0.78	0.085	0.03	26.593	10.89	0.043	0.02	0.95	2.87
009	0.012	0.00	2.879	0.03	2.879	0.03	0.115	0.00	50.095	2.99	0.058	0.00	0.25	0.79
010	0.027	0.03	2.036	2.14	2.904	0.41	0.081	0.09	22.350	12.39	0.041	0.04	1.13	3.28
011	0.010	0.00	1.810	0.47	3.649	4.14	0.072	0.02	38.136	0.55	0.036	0.01	0.46	1.08
012	0.005	0.00	0.897	1.23	2.557	2.09	0.042	0.04	28.243	13.74	0.018	0.02	1.30	3.63
013	0.011	0.01	2.638	1.39	2.638	1.39	0.106	0.06	27.161	12.38	0.053	0.03	1.17	3.26
014	0.025	0.03	2.699	0.63	8.987	1.10	0.203	0.17	40.219	23.22	0.054	0.01	2.01	6.12
015	0.007	0.00	1.842	0.76	1.842	0.76	0.074	0.03	32.855	14.32	0.037	0.02	1.18	3.79
016	0.004	0.00	0.951	0.38	3.121	0.13	0.069	0.05	28.661	28.18	0.027	0.01	2.10	7.51
017	0.010	0.00	2.404	0.66	2.404	0.66	0.096	0.03	28.827	14.48	0.048	0.01	1.21	3.82
018	0.006	0.00	1.440	0.71	1.440	0.71	0.129	0.17	29.052	7.85	0.029	0.01	0.71	2.07
019	0.016	0.02	1.533	1.08	2.425	0.70	0.081	0.00	19.950	6.60	0.031	0.02	0.65	1.74
020	0.006	0.00	1.556	0.09	1.556	0.09	0.062	0.00	16.825	2.19	0.031	0.00	0.22	0.58
021	0.008	0.00	2.022	0.86	2.022	0.86	0.081	0.03	24.415	8.03	0.040	0.02	0.75	2.12
022	0.008	0.00	2.089	0.16	2.089	0.16	0.084	0.01	29.588	1.90	0.042	0.00	0.19	0.50
023	0.136	999.99	3.094	999.99	48.263	999.99	0.124	999.99	433.125	999.99	0.062	999.99	999.99	999.99
024	0.005	0.01	1.185	1.67	2.543	1.04	0.047	0.07	29.499	21.79	0.027	0.03	1.83	5.76
025	0.010	0.00	2.391	0.31	2.391	0.31	0.096	0.01	26.729	12.74	0.048	0.01	1.01	3.38
026	0.008	0.00	1.895	0.52	1.895	0.52	0.076	0.02	21.801	7.38	0.038	0.01	0.64	1.95
027	0.005	0.00	1.306	0.54	2.655	2.16	0.052	0.02	39.075	21.45	0.026	0.01	1.76	5.69
028	0.010	0.00	1.821	0.54	1.821	0.54	0.073	0.02	16.661	8.46	0.036	0.01	0.72	2.23
030	0.020	0.03	0.569	0.20	10.862	1.85	0.189	0.11	79.152	2.95	0.011	0.00	0.50	0.86
031	0.008	0.00	1.982	0.21	1.982	0.21	0.079	0.01	33.011	7.52	0.040	0.00	0.61	1.99
032	0.056	0.09	2.150	0.33	8.001	3.03	0.443	0.70	123.102	86.80	0.043	0.01	6.61	23.09
033	0.007	0.00	1.761	0.60	3.075	2.03	0.070	0.02	52.556	1.16	0.035	0.01	0.31	0.59
034	0.008	0.00	2.022	1.21	2.022	1.21	0.081	0.05	17.727	0.25	0.040	0.02	0.24	0.41
035	0.051	0.08	3.455	0.54	3.455	0.54	0.287	0.32	49.752	10.15	0.101	0.05	0.94	2.66
036	0.009	0.00	2.257	0.07	2.257	0.07	0.090	0.00	18.512	1.45	0.045	0.00	0.13	0.38
037	0.010	0.00	2.504	0.56	2.504	0.56	0.100	0.02	20.154	15.41	0.050	0.01	1.25	4.08
038	0.007	0.00	1.634	1.04	1.634	1.04	0.065	0.04	18.879	6.71	0.033	0.02	0.70	1.77
039	0.006	0.00	1.413	0.71	1.413	0.71	0.078	0.01	23.529	16.59	0.028	0.01	1.35	4.39
040	0.016	0.01	2.632	0.28	2.632	0.28	0.105	0.01	38.668	6.36	0.053	0.01	0.54	1.68
041	0.005	0.00	1.359	0.33	3.806	0.94	0.054	0.01	17.638	3.81	0.027	0.01	0.39	1.02
042	0.006	0.00	0.978	0.08	1.821	1.61	0.058	0.03	23.207	10.59	0.020	0.00	0.90	2.82
043	0.009	999.99	2.330	999.99	6.525	999.99	0.093	999.99	59.657	999.99	0.047	999.99	999.99	999.99
044	0.005	0.00	1.232	0.32	2.196	1.61	0.049	0.01	44.743	4.80	0.025	0.01	0.53	1.30
045	0.008	0.00	2.049	0.88	10.913	3.89	0.082	0.04	41.914	11.83	0.041	0.02	1.31	3.20
080	0.011	0.01	0.881	0.49	8.198	1.60	0.125	0.16	38.850	3.90	0.018	0.01	0.51	1.06
081	0.004	0.00	0.917	0.50	3.238	0.05	0.063	0.03	19.698	0.25	0.018	0.01	0.13	0.16
082	0.006	0.00	1.563	0.55	1.563	0.55	0.063	0.02	19.708	0.27	0.031	0.01	0.15	0.20
083	0.008	0.00	2.056	0.34	6.890	1.32	0.158	0.14	32.737	8.51	0.041	0.01	0.84	2.23
Ar.Mean	0.014	0.01	1.876	0.61	4.330	1.14	0.102	0.07	40.752	10.28	0.039	0.01	0.93	2.79
Std.dev.	0.021	0.02	0.613	0.44	6.903	1.10	0.068	0.12	60.678	13.27	0.014	0.01	0.99	3.49

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 5-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015	SCREEN MISSING		
016			
017			
018			
019	LIQUID SPILLED IN TRANSPORT		
020			
021		LIQUID SPILLED IN TRANSPORT	
022			
023	VOID/DEAD BIRD IN CONTAINER	LIQUID VERY DIRTY	MISSING SAMPLE A
024		VOMIT BALL ON SCREEN	
025			
026			
027		LIQUID CLOUDY. BIRD DROPPINGS	
028			
030	SCREEN MISSING.LIQUID DIRTY	LIQUID DIRTY	
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	VOID/VANDALISM	BIRD DROPPINGS ON SCREEN	MISSING SAMPLE A
044	SCREEN MISSING		
045	BIRD DROPPINGS ON SCREEN		
080			
081			
082			
083			

A R I Z O N A P U B L I C S E R V I C E

MONTHLY REPORT for 6-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Page

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.456	0.03	0.113	0.07	1.065	0.07	0.144	0.04	0.682	0.10	0.380	0.03	0.761	0.05	0.038	0.00
002	0.478	0.02	0.119	0.07	0.879	0.20	0.119	0.07	0.642	0.35	0.398	0.02	0.797	0.04	0.067	0.05
003	0.514	0.20	0.257	0.10	1.261	0.23	0.283	0.05	0.514	0.20	0.321	0.12	0.643	0.25	0.032	0.01
004	0.308	0.31	0.269	0.38	0.710	0.13	0.103	0.05	0.576	0.69	0.309	0.16	0.617	0.31	0.031	0.02
005	0.190	0.02	0.095	0.01	0.480	0.24	0.083	0.08	0.285	0.03	0.475	0.05	0.950	0.11	0.048	0.0[illegible]
006	0.159	999.99	0.080	999.99	0.636	999.99	0.111	999.99	0.238	999.99	0.397	999.99	0.795	999.99	0.040	999.99
007	0.235	0.13	0.117	0.06	0.864	0.36	0.118	0.03	0.352	0.19	0.400	0.06	0.801	0.11	0.040	0.01
008	0.338	0.01	0.084	0.00	0.589	0.15	0.127	0.02	0.592	0.19	0.422	0.01	0.844	0.03	0.042	0.00
009	0.558	0.04	0.228	0.26	1.205	0.11	0.093	0.01	0.738	0.32	0.465	0.03	0.929	0.06	0.046	0.0[illegible]
010	0.401	0.15	0.080	0.00	1.203	0.44	0.144	0.12	0.641	0.30	0.402	0.01	0.805	0.03	0.040	0.0[illegible]
011	0.362	0.09	0.261	0.12	0.884	0.15	0.203	0.04	0.525	0.57	0.453	0.11	0.905	0.21	0.045	0.01
012	0.635	0.69	0.773	0.77	1.154	0.36	0.363	0.18	0.955	0.94	0.233	0.02	1.133	1.29	0.083	0.1[illegible]
013	1.061	0.99	1.037	1.32	5.327	6.88	1.249	1.74	0.636	0.14	0.413	0.12	0.825	0.24	0.041	0.0[illegible]
014	0.821	0.16	0.818	0.52	2.375	0.07	0.200	0.10	1.276	0.33	0.457	0.01	0.913	0.03	0.069	0.05
015	0.262	0.17	0.131	0.09	0.701	0.01	0.118	0.15	0.480	0.43	0.438	0.01	0.876	0.02	0.044	0.00
016	0.649	0.22	0.284	0.30	0.553	0.24	0.119	0.02	0.784	0.05	0.304	0.06	0.608	0.13	0.044	0.0[illegible]
017	0.176	0.01	0.217	0.25	2.075	2.71	0.125	0.16	0.393	0.24	0.440	0.02	0.880	0.05	0.044	0.0[illegible]
018	0.205	0.11	0.103	0.06	0.690	0.19	0.084	0.09	0.210	0.03	0.350	0.05	0.699	0.09	0.035	0.00
019	0.287	999.99	0.287	999.99	1.005	999.99	0.072	999.99	0.718	999.99	0.359	999.99	0.718	999.99	0.036	999.9[illegible]
020	0.490	0.01	0.246	0.17	0.572	0.15	0.122	0.05	0.534	0.58	0.409	0.01	0.817	0.02	0.041	0.0[illegible]
021	0.402	0.13	0.240	0.14	0.642	0.27	0.162	0.02	0.565	0.11	0.406	0.03	0.812	0.07	0.041	0.00
022	0.166	0.01	0.123	0.07	0.742	0.11	0.116	0.01	0.248	0.02	0.414	0.03	0.828	0.06	0.041	[illegible]
023	0.613	0.10	2.786	1.07	12.951	5.65	5.113	2.73	0.593	0.69	0.442	0.05	0.884	0.11	0.044	[illegible]
024	0.233	0.11	0.160	0.03	0.713	0.02	0.103	0.00	0.566	0.60	0.400	0.08	0.801	0.16	0.088	0.1[illegible]
025	0.234	0.04	0.171	0.09	0.702	0.11	0.058	0.01	0.351	0.05	0.585	0.09	1.169	0.18	0.058	0.01
026	0.242	0.14	0.121	0.07	0.647	0.26	0.076	0.07	0.362	0.21	0.410	0.04	0.820	0.09	0.041	0.0[illegible]
027	0.173	0.08	0.139	0.14	0.585	0.09	0.097	0.06	0.180	0.04	0.300	0.07	0.600	0.15	0.030	0.0[illegible]
028	0.141	0.01	0.141	0.01	2.590	1.13	0.190	0.03	0.211	0.01	0.352	0.02	0.704	0.04	0.035	0.00
030	2.597	4.25	1.780	1.91	10.291	14.22	2.981	4.48	5.698	9.98	0.303	0.02	1.538	1.90	0.063	0.06
031	0.162	0.00	0.081	0.00	0.647	0.02	0.081	0.00	0.243	0.01	0.404	0.01	0.809	0.02	0.040	0.0[illegible]
032	0.353	0.04	0.259	0.14	1.410	0.18	0.246	0.00	0.405	0.32	0.441	0.06	0.881	0.11	0.044	0.0[illegible]
033	0.297	0.02	0.220	0.13	1.064	0.03	0.174	0.02	0.402	0.34	0.312	0.15	0.624	0.29	0.031	0.01
034	0.363	0.07	0.544	0.76	0.659	0.00	0.124	0.02	0.577	0.16	0.371	0.08	0.742	0.17	0.037	0.0[illegible]
035	0.202	0.02	0.405	0.04	0.906	0.12	0.150	0.05	0.463	0.35	0.506	0.05	1.013	0.10	0.051	0.0[illegible]
036	0.221	0.13	0.182	0.21	0.519	0.11	0.091	0.10	0.223	0.02	0.372	0.03	0.745	0.05	0.037	0.00
037	0.174	0.01	0.129	0.08	0.522	0.04	0.095	0.01	0.261	0.02	0.435	0.03	0.869	0.06	0.043	0.0[illegible]
038	0.213	0.11	0.107	0.06	0.651	0.04	0.081	0.03	0.219	0.03	0.365	0.06	0.730	0.12	0.036	0.0[illegible]
039	0.191	0.11	0.158	0.18	0.703	0.33	0.078	0.03	0.349	0.30	0.323	0.02	0.646	0.05	0.032	0.0[illegible]
040	0.372	0.03	0.372	0.03	1.212	0.28	0.346	0.12	0.279	0.02	0.465	0.03	0.929	0.07	0.046	0.00
041	0.266	0.02	0.202	0.15	0.932	0.06	0.174	0.09	0.372	0.36	0.333	0.02	0.666	0.05	0.033	0.0[illegible]
042	0.141	0.00	0.107	0.07	0.855	0.87	0.068	0.07	0.212	0.01	0.354	0.01	0.707	0.02	0.035	0.0[illegible]
043	0.916	999.99	0.733	999.99	1.649	999.99	0.366	999.99	1.649	999.99	0.458	999.99	0.916	999.99	0.046	999.99
044	0.331	0.33	0.331	0.33	0.745	0.16	0.240	0.11	0.373	0.25	0.414	0.00	0.828	0.01	0.041	0.0[illegible]
045	0.210	0.12	0.173	0.20	2.886	1.01	0.333	0.34	0.213	0.02	0.356	0.03	0.711	0.07	0.036	0.0[illegible]
080	0.875	0.12	0.202	0.13	1.952	0.37	0.235	0.25	0.807	0.25	0.337	0.01	0.674	0.01	0.071	0.0[illegible]
081	0.970	0.20	0.139	0.03	1.296	0.15	0.168	0.06	1.047	0.35	0.347	0.07	0.693	0.14	0.077	0.0[illegible]
082	0.232	0.18	0.143	0.14	0.662	0.17	0.106	0.02	0.322	0.21	0.313	0.09	0.626	0.18	0.031	0.0[illegible]
083	0.578	0.24	0.216	0.13	1.956	0.57	0.360	0.23	0.584	0.05	0.365	0.03	0.730	0.06	0.151	0.1[illegible]
Ar.Mean	0.426	0.22	0.332	0.24	1.569	0.87	0.341	0.27	0.615	0.45	0.390	0.05	0.813	0.16	0.047	[illegible]
Std.Dev.	0.397	0.64	0.471	0.38	2.294	2.43	0.831	0.79	0.804	1.47	0.064	0.04	0.165	0.33	0.020	[illegible]

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AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.015	0.00	3.804	0.27	3.804	0.27	0.152	0.01	7.840	7.81	0.076	0.01	0.63	2.07
002	0.016	0.00	3.984	0.20	3.984	0.20	0.159	0.01	8.257	8.34	0.080	0.00	0.69	2.21
003	0.013	0.00	3.213	1.23	3.213	1.23	0.129	0.05	18.978	17.16	0.064	0.02	1.49	4.53
004	0.012	0.01	3.088	1.57	3.088	1.57	0.124	0.06	10.218	12.69	0.062	0.03	1.28	3.32
005	0.019	0.00	4.750	0.55	4.750	0.55	0.190	0.02	4.750	0.55	0.095	0.01	0.16	0.22
006	0.016	999.99	3.975	999.99	3.975	999.99	0.159	999.99	7.950	999.99	0.080	999.99	999.99	999.99
007	0.016	0.00	4.004	0.56	4.004	0.56	0.160	0.02	18.814	13.80	0.080	0.01	1.14	3.65
008	0.017	0.00	4.219	0.13	4.219	0.13	0.169	0.01	16.071	5.57	0.084	0.00	0.45	1.48
009	0.019	0.00	4.647	0.29	4.647	0.29	0.186	0.01	11.397	13.21	0.093	0.01	1.05	3.50
010	0.016	0.00	4.025	0.15	4.025	0.15	0.161	0.01	9.951	11.71	0.080	0.00	0.93	3.10
011	0.074	0.11	4.527	1.07	4.527	1.07	0.341	0.28	28.018	20.91	0.091	0.02	1.77	5.52
012	0.281	0.54	4.331	3.79	2.330	0.21	1.383	2.57	40.329	26.06	0.047	0.00	2.68	6.81
013	0.078	0.04	7.307	5.19	10.136	10.84	0.165	0.05	92.400	98.06	0.082	0.02	8.97	25.85
014	0.018	0.00	4.567	0.13	8.617	7.97	0.183	0.01	24.595	8.41	0.091	0.00	1.27	2.94
015	0.018	0.00	4.379	0.08	4.379	0.08	0.175	0.00	16.586	11.96	0.088	0.00	1.03	3.18
016	0.045	0.06	3.039	0.65	3.039	0.65	0.230	0.19	21.129	20.74	0.061	0.01	1.87	5.49
017	0.138	0.24	4.400	0.23	8.257	7.49	0.176	0.01	21.702	21.74	0.088	0.00	2.37	5.93
018	0.014	0.00	3.496	0.46	3.496	0.46	0.140	0.02	17.614	6.47	0.070	0.01	0.57	1.70
019	0.014	999.99	3.589	999.99	3.589	999.99	0.144	999.99	15.793	999.99	0.072	999.99	999.99	999.99
020	0.016	0.00	4.088	0.08	4.088	0.08	0.164	0.00	28.680	15.24	0.082	0.00	1.17	4.05
021	0.016	0.00	4.058	0.35	4.058	0.35	0.162	0.01	26.539	9.06	0.081	0.01	0.75	2.39
022	0.017	0.00	4.138	0.29	4.138	0.29	0.166	0.01	11.529	2.49	0.083	0.01	0.24	0.65
023	0.439	0.05	4.420	0.54	41.893	12.54	0.458	0.58	357.589	115.18	0.088	0.01	7.95	30.48
024	0.086	0.14	4.004	0.78	7.958	8.68	0.687	1.09	6.536	4.29	0.080	0.02	1.15	2.44
025	0.056	0.06	5.846	0.90	5.846	0.90	0.234	0.04	5.846	0.90	0.117	0.02	0.24	0.36
026	0.016	0.00	4.098	0.43	4.098	0.43	0.164	0.02	10.612	0.52	0.082	0.01	0.16	0.18
027	0.012	0.00	3.000	0.75	3.000	0.75	0.120	0.03	17.550	2.70	0.060	0.01	0.35	0.72
028	0.014	0.00	3.522	0.19	8.665	10.10	0.141	0.01	14.737	3.44	0.070	0.00	1.07	2.76
030	0.344	0.09	3.027	0.16	28.104	20.85	1.018	0.79	140.732	165.96	0.061	0.00	16.05	43.61
031	0.016	0.00	4.045	0.11	4.045	0.11	0.162	0.00	6.838	5.48	0.081	0.00	0.41	1.46
032	0.018	0.00	4.406	0.56	4.406	0.56	0.176	0.02	23.138	9.98	0.088	0.01	0.86	2.63
033	0.027	0.02	3.121	1.47	3.121	1.47	0.125	0.06	29.941	25.94	0.062	0.03	2.14	6.87
034	0.320	0.05	3.710	0.83	8.652	9.05	1.203	2.08	12.198	4.60	0.074	0.02	1.28	2.57
035	0.052	0.07	5.062	0.48	5.062	0.48	0.202	0.02	22.564	14.27	0.101	0.01	1.45	3.78
036	0.015	0.00	3.723	0.27	3.723	0.27	0.149	0.01	8.389	9.06	0.074	0.01	0.73	2.40
037	0.017	0.00	4.346	0.31	4.346	0.31	0.174	0.01	8.692	0.62	0.087	0.01	0.21	0.18
038	0.015	0.00	3.650	0.58	3.650	0.58	0.146	0.02	9.546	2.96	0.073	0.01	0.33	0.78
039	0.013	0.00	3.228	0.24	3.228	0.24	0.129	0.01	17.164	12.90	0.065	0.00	1.03	3.42
040	0.019	0.00	4.647	0.35	4.647	0.35	0.186	0.01	32.636	8.01	0.093	0.01	0.67	2.12
041	0.013	0.00	3.328	0.23	3.328	0.23	0.133	0.01	16.982	21.11	0.067	0.00	1.59	5.62
042	0.014	0.00	3.536	0.11	3.536	0.11	0.141	0.00	7.484	8.00	0.071	0.00	0.66	2.12
043	0.018	999.99	4.580	999.99	4.580	999.99	0.183	999.99	27.482	999.99	0.092	999.99	999.99	999.99
044	0.017	0.00	4.138	0.03	4.138	0.03	0.166	0.00	26.470	9.76	0.083	0.00	0.79	2.59
045	0.014	0.00	3.556	0.33	11.989	3.13	0.142	0.01	30.078	18.46	0.071	0.01	1.69	4.89
080	0.013	0.00	3.369	0.06	9.433	0.18	0.135	0.00	20.843	9.04	0.067	0.00	0.75	2.39
081	0.014	0.00	3.466	0.70	3.466	0.70	0.139	0.03	20.578	13.69	0.069	0.01	1.16	3.61
082	0.013	0.00	3.131	0.91	3.131	0.91	0.125	0.04	8.585	0.05	0.063	0.02	0.21	0.31
083	0.015	0.00	3.650	0.30	6.800	6.00	0.146	0.01	17.980	11.64	0.073	0.01	1.38	3.34
Ar.Mean	0.052	0.03	4.005	0.64	6.150	2.52	0.246	0.18	28.340	18.01	0.078	0.01	1.69	4.89
Std.dev.	0.094	0.09	0.770	0.93	6.603	4.43	0.269	0.52	53.399	31.00	0.013	0.01	2.87	8.11

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DEPOSITION DATA
Comments and Messages Only

Page

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003	SCREEN MISSING		
004		SCREEN MISSING	
005			
006	SCREEN MISSING	VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
007	DECAYED PLANT MATERIAL IN SAMPLE	BIRD DROPPINGS ON SCREEN	
008			
009		SCREEN MISSING	
010			
011			
012	SCREEN MISSING. LIQUID GREEN	SCREEN MISSING	
013	SCREEN MISSING	LIQUID CLOUDY	
014	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
015			
016		LIQUID GREEN	
017			
018			
019	VOID/DEAD BIRD IN CONTAINER		MISSING SAMPLE A
020			
021			
022			
023	LIQUID CLOUDY	LIQUID CLOUDY	
024			
025			
026			
027			
028			
030		LIQUID CLOUDY	
031			
032			
033			
034		LIQUID GREEN	
035			
036		SCREEN MISSING	
037		SCREEN MISSING	
038			
039			
040			
041			
042			
043	BIRD DROPPINGS ON SCREEN	VOID/VANDALISM	MISSING SAMPLE B
044			
045		ALGAE ON SCREEN	
080			
081			
082	SCREEN MISSING		
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 7-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.430	0.12	0.221	0.14	1.019	0.11	0.233	0.08	0.455	0.13	0.215	0.06	0.430	0.12	0.021	0.01
002	0.363	0.20	0.149	0.17	0.867	0.11	0.185	0.00	0.495	0.07	0.310	0.04	0.619	0.08	0.031	0.00
003	0.390	0.00	0.260	0.00	1.104	0.14	0.325	0.03	0.519	0.00	0.325	0.00	0.649	0.00	0.032	0.00
004	0.425	999.99	1.488	999.99	0.638	999.99	0.213	999.99	0.531	999.99	0.266	999.99	0.531	999.99	0.027	999.99
005	0.250	0.01	0.125	0.01	0.686	0.09	0.137	0.01	0.187	0.01	0.312	0.01	0.625	0.03	0.031	0.00
006	0.329	0.17	0.466	0.44	0.719	0.21	0.164	0.08	0.195	0.02	0.325	0.04	0.650	0.08	0.033	0.00
007	0.374	0.09	0.180	0.08	0.982	0.01	0.163	0.05	0.379	0.34	0.312	0.07	0.623	0.15	0.031	0.01
008	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
009	0.331	0.13	0.265	0.00	1.192	0.26	0.285	0.01	0.464	0.13	0.331	0.00	0.662	0.00	0.033	0.00
010	0.347	0.01	0.290	0.13	1.273	0.05	0.267	0.08	0.579	0.02	0.289	0.01	0.579	0.02	0.029	0.00
011	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
012	0.361	0.04	0.589	0.42	1.255	0.22	0.413	0.27	0.488	0.29	0.301	0.03	0.602	0.07	0.030	0.00
013	0.684	999.99	3.146	999.99	4.924	999.99	1.368	999.99	1.915	999.99	0.342	999.99	0.684	999.99	0.191	999.99
014	0.617	999.99	0.370	999.99	2.222	999.99	0.383	999.99	0.741	999.99	0.309	999.99	0.617	999.99	0.031	999.99
015	0.180	0.09	0.247	0.04	1.616	0.54	0.284	0.05	0.185	0.03	0.309	0.06	0.617	0.11	0.031	0.01
016	0.386	0.05	0.163	0.08	0.996	0.06	0.257	0.08	0.319	0.33	0.279	0.05	0.558	0.09	0.028	0.00
017	0.237	999.99	0.118	999.99	0.710	999.99	0.130	999.99	0.177	999.99	0.296	999.99	0.591	999.99	0.030	999.99
018	0.220	0.01	0.166	0.12	0.605	0.13	0.131	0.04	0.305	0.29	0.275	0.01	0.549	0.02	0.027	0.00
019	0.252	0.01	0.188	0.12	0.945	0.15	0.170	0.04	0.442	0.14	0.315	0.01	0.630	0.02	0.031	0.00
020	0.496	0.01	0.273	0.06	0.507	0.21	0.125	0.03	0.546	0.11	0.278	0.06	0.557	0.11	0.028	0.01
021	0.460	0.17	0.171	0.09	0.757	0.01	0.193	0.02	0.366	0.35	0.293	0.04	0.586	0.09	0.029	0.00
022	0.213	0.01	0.213	0.01	0.850	0.03	0.223	0.03	0.477	0.09	0.266	0.01	0.531	0.02	0.027	0.00
023	1.262	999.99	2.145	999.99	17.665	999.99	4.795	999.99	1.009	999.99	0.315	999.99	0.631	999.99	0.032	999.99
024	0.316	0.11	0.112	0.04	0.790	0.27	0.155	0.16	0.474	0.16	0.279	0.10	0.558	0.19	0.028	0.01
025	0.147	0.00	0.222	0.15	0.589	0.02	0.222	0.15	0.221	0.01	0.368	0.01	0.736	0.02	0.037	0.00
026	0.265	0.02	0.133	0.01	0.727	0.08	0.173	0.04	0.302	0.22	0.331	0.03	0.663	0.05	0.033	0.00
027	0.294	0.11	0.176	0.11	0.531	0.10	0.166	0.03	0.177	0.01	0.296	0.01	0.591	0.03	0.030	0.00
028	0.296	0.08	0.176	0.10	1.557	0.19	0.190	0.02	0.275	0.21	0.299	0.04	0.599	0.07	0.030	0.00
030	0.520	0.03	0.475	0.06	3.094	0.10	0.770	0.14	0.565	0.12	0.269	0.09	0.538	0.18	0.027	0.01
031	0.223	0.02	0.112	0.01	0.558	0.06	0.128	0.00	0.335	0.03	0.279	0.03	0.558	0.06	0.028	0.00
032	0.433	0.33	0.663	1.06	1.195	0.23	0.305	0.15	0.925	0.77	0.318	0.04	0.635	0.08	0.032	0.00
033	0.230	0.00	0.173	0.12	0.921	0.00	0.196	0.12	0.403	0.11	0.288	0.00	0.575	0.00	0.029	0.00
034	0.300	0.12	0.120	0.00	0.719	0.01	0.150	0.03	0.329	0.30	0.299	0.00	0.599	0.01	0.030	0.00
035	0.329	0.00	0.329	0.00	1.316	0.01	0.412	0.10	0.247	0.00	0.411	0.00	0.823	0.00	0.041	0.00
036	0.225	0.01	0.225	0.01	0.675	0.04	0.164	0.07	0.395	0.13	0.281	0.02	0.563	0.03	0.028	0.00
037	0.291	0.00	0.146	0.00	0.728	0.00	0.218	0.00	0.328	0.22	0.364	0.00	0.728	0.00	0.036	0.00
038	0.273	0.08	0.081	0.05	0.819	0.23	0.097	0.05	0.347	0.34	0.276	0.03	0.553	0.07	0.028	0.00
039	0.206	999.99	0.103	999.99	0.411	999.99	0.123	999.99	0.154	999.99	0.257	999.99	0.514	999.99	0.026	999.99
040	0.148	0.00	0.443	0.00	1.625	0.29	0.488	0.09	0.222	0.00	0.369	0.00	0.739	0.00	0.037	0.00
041	0.310	0.03	0.103	0.01	0.723	0.07	0.149	0.01	0.576	0.37	0.258	0.03	0.516	0.05	0.026	0.00
042	0.158	0.08	0.108	0.02	0.483	0.02	0.155	0.03	0.251	0.21	0.271	0.05	0.542	0.10	0.027	0.00
043	0.665	0.19	0.380	0.15	1.501	0.05	0.477	0.16	0.569	0.68	0.333	0.10	0.665	0.19	0.033	0.01
044	0.301	0.08	0.179	0.10	0.733	0.10	0.164	0.01	0.183	0.03	0.306	0.04	0.611	0.08	0.031	0.00
045	0.262	0.11	0.209	0.00	2.249	0.54	0.272	0.02	0.287	0.26	0.261	0.00	0.523	0.00	0.026	0.00
080	0.612	0.23	0.153	0.11	2.187	0.40	0.454	0.23	0.763	0.13	0.254	0.01	0.508	0.02	0.025	0.00
081	0.726	0.16	0.280	0.13	1.165	0.26	0.295	0.01	0.891	0.05	0.279	0.02	0.557	0.03	0.028	0.00
082	0.601	0.31	0.545	0.42	0.933	0.07	0.203	0.02	0.709	0.52	0.275	0.01	0.549	0.02	0.027	0.00
083	0.540	0.14	0.178	0.11	2.034	0.14	0.515	0.00	0.538	0.09	0.299	0.01	0.599	0.03	0.030	0.00
r.Mean	0.376	0.08	0.371	0.12	1.517	0.14	0.371	0.06	0.462	0.18	0.300	0.03	0.599	0.06	0.033	0.00
Std.Dev.	0.200	0.08	0.551	0.19	2.561	0.13	0.700	0.06	0.302	0.18	0.035	0.03	0.071	0.05	0.024	0.00

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 7-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.031	0.04	2.148	0.59	2.148	0.59	0.086	0.02	28.121	4.34	0.043	0.01	0.45	1.13
002	0.012	0.00	3.096	0.41	3.096	0.41	0.124	0.02	24.030	0.54	0.091	0.05	0.15	0.18
003	0.013	0.00	3.246	0.02	3.246	0.02	0.130	0.00	34.423	6.72	0.065	0.00	0.50	1.79
004	0.011	999.99	2.657	999.99	2.657	999.99	0.106	999.99	34.011	999.99	0.053	999.99	999.99	999.99
005	0.025	0.03	3.123	0.14	3.123	0.14	0.125	0.01	15.686	6.94	0.062	0.00	0.53	1.85
006	0.013	0.00	3.252	0.38	3.252	0.38	0.130	0.02	19.586	4.85	0.065	0.01	0.48	1.27
007	0.023	0.02	3.116	0.74	3.116	0.74	0.125	0.03	23.934	0.47	0.062	0.01	0.20	0.26
008	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
009	0.013	0.00	3.311	0.00	3.311	0.00	0.132	0.00	34.431	5.30	0.066	0.00	0.42	1.41
010	0.029	0.04	2.893	0.11	5.545	5.41	0.116	0.00	28.318	2.42	0.058	0.00	0.59	1.53
011	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
012	0.607	1.06	3.011	0.33	9.503	3.76	1.279	1.54	46.747	24.88	0.060	0.01	2.35	6.56
013	0.137	999.99	3.419	999.99	20.515	999.99	0.137	999.99	98.471	999.99	0.068	999.99	999.99	999.99
014	0.037	999.99	3.086	999.99	8.640	999.99	0.123	999.99	33.326	999.99	0.062	999.99	999.99	999.99
015	0.012	0.00	3.086	0.56	8.640	1.56	0.123	0.02	30.519	11.63	0.062	0.01	1.05	3.07
016	0.016	0.01	2.791	0.46	2.791	0.46	0.112	0.02	32.520	4.61	0.235	0.35	0.47	1.20
017	0.012	999.99	2.957	999.99	2.957	999.99	0.118	999.99	17.743	999.99	0.059	999.99	999.99	999.99
018	0.011	0.00	2.746	0.11	2.746	0.11	0.110	0.00	15.851	7.05	0.055	0.00	0.56	1.87
019	0.019	0.01	3.149	0.08	3.149	0.08	0.126	0.00	16.421	7.96	0.063	0.00	0.61	2.11
020	0.097	0.05	2.785	0.56	2.785	0.56	0.262	0.28	25.948	10.20	0.056	0.01	0.87	2.69
021	0.012	0.00	2.928	0.43	2.928	0.43	0.117	0.02	20.713	8.87	0.059	0.01	0.75	2.34
022	0.011	0.00	2.657	0.09	2.657	0.09	0.106	0.00	26.066	4.03	0.053	0.00	0.31	1.07
023	0.189	999.99	3.154	999.99	35.329	999.99	0.126	999.99	277.588	999.99	0.063	999.99	999.99	999.99
024	0.120	0.19	2.791	0.95	2.791	0.95	0.112	0.04	14.882	25.14	0.056	0.02	2.02	6.66
025	0.037	0.05	3.678	0.10	3.678	0.10	0.147	0.00	28.074	18.41	0.074	0.00	1.36	4.91
026	0.013	0.00	3.314	0.25	3.314	0.25	0.133	0.01	19.987	6.82	0.066	0.01	0.56	1.81
027	0.012	0.00	2.957	0.13	2.957	0.13	0.118	0.01	31.963	3.75	0.059	0.00	0.31	0.99
028	0.012	0.00	2.994	0.36	8.385	1.02	0.120	0.01	22.467	6.82	0.060	0.01	0.64	1.80
030	0.132	0.01	2.691	0.90	13.004	0.86	0.108	0.04	59.826	8.60	0.054	0.02	0.80	2.26
031	0.011	0.00	2.791	0.29	2.791	0.29	0.112	0.01	13.455	3.62	0.056	0.01	0.32	0.96
032	0.191	0.36	3.177	0.40	7.645	8.54	0.842	1.41	40.108	12.72	0.064	0.01	1.86	3.82
033	0.012	0.00	2.877	0.01	2.877	0.01	0.115	0.00	23.027	13.89	0.058	0.00	1.02	3.71
034	0.012	0.00	2.994	0.03	2.994	0.03	0.120	0.00	13.169	2.25	0.060	0.00	0.20	0.60
035	0.016	0.00	4.114	0.02	4.114	0.02	0.165	0.00	42.772	9.64	0.124	0.08	0.71	2.57
036	0.011	0.00	2.813	0.15	2.813	0.15	0.113	0.01	18.093	7.74	0.056	0.00	0.60	2.06
037	0.015	0.00	3.640	0.00	3.640	0.00	0.146	0.00	24.022	1.46	0.073	0.00	0.12	0.39
038	0.011	0.00	2.764	0.34	2.764	0.34	0.111	0.01	14.550	10.31	0.055	0.01	0.85	2.73
039	0.010	999.99	2.571	999.99	2.571	999.99	0.103	999.99	24.686	999.99	0.051	999.99	999.99	999.99
040	0.015	0.00	3.695	0.02	3.695	0.02	0.148	0.00	53.938	4.11	0.074	0.00	0.32	1.09
041	0.010	0.00	2.581	0.26	6.254	7.08	0.103	0.01	14.400	0.58	0.052	0.01	0.61	1.87
042	0.011	0.00	2.711	0.49	2.711	0.49	0.108	0.02	21.489	0.39	0.054	0.01	0.14	0.18
043	0.123	0.19	3.327	0.97	5.882	4.14	0.303	0.30	58.695	7.54	0.067	0.02	1.05	2.15
044	0.012	0.00	3.055	0.42	3.055	0.42	0.122	0.02	20.691	0.41	0.061	0.01	0.12	0.16
045	0.010	0.00	2.614	0.02	7.319	0.06	0.105	0.00	19.862	1.92	0.052	0.00	0.21	0.52
080	0.010	0.00	2.539	0.11	9.184	4.45	0.102	0.00	33.647	13.60	0.051	0.00	1.38	3.71
081	0.050	0.01	2.786	0.17	5.216	4.69	0.219	0.21	27.994	10.63	0.056	0.00	1.17	2.99
082	0.292	0.41	2.746	0.11	10.013	14.42	1.570	2.24	30.176	2.08	0.055	0.00	1.47	3.80
083	0.012	0.00	2.995	0.14	8.385	0.39	0.120	0.01	35.880	3.12	0.060	0.00	0.30	0.82
Ar.Mean	0.054	0.06	2.996	0.29	5.656	1.59	0.202	0.16	34.615	7.16	0.065	0.02	0.71	2.07
Std.dev.	0.103	0.19	0.355	0.27	5.684	2.95	0.288	0.47	39.710	5.96	0.028	0.06	0.53	1.56

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 7-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004	SCREEN ON GROUND	VOID/CONTAINER DRY	MISSING SAMPLE B
005			
006			
007			
008	VOID/CONTAINER DRY	VOID/CONTAINER DRY	MISSING SAMPLE A and B
009			
010		ALGAE ON SCREEN	
011	VOID/CONTAINER DRY	VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE A and B
012	LIQUID GREEN	LIQUID GREEN	
013	LIQUID GREEN	VOID/VANDALISM	MISSING SAMPLE B
014		VOID/CONTENTS SPILLED WHEN CONTAINER DROPPED	MISSING SAMPLE B
015			
016			
017	VOID/DEAD BIRD IN CONTAINER		MISSING SAMPLE A
018			
019			
020			
021			
022			
023	LIQUID TURBID	VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
024		BIRD DROPPINGS ON SCREEN	
025			
026			
027			
028			
030		SCREEN MISSING	
031			
032			
033			
034			
035			
036			
037			
038			
039	VOID/CONTAINER DRY		MISSING SAMPLE A
040			
041			
042			
043	LIQUID GREEN		
044			
045			
080			
081			
082			
083			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 8-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.747	0.25	0.270	0.33	0.954	0.16	0.277	0.10	0.850	0.05	0.531	0.03	1.063	0.06	0.053	0.00
002	0.593	0.20	0.355	0.22	1.078	0.30	0.322	0.01	0.948	0.42	0.597	0.03	1.194	0.07	0.355	0.59
003	0.581	0.04	0.194	0.01	1.255	0.11	0.291	0.06	0.525	0.45	0.484	0.03	0.968	0.06	0.144	0.05
004	0.548	0.31	0.450	0.51	1.568	0.38	0.356	0.20	0.675	0.76	0.466	0.05	0.932	0.11	0.148	0.20
005	0.781	0.81	0.884	1.39	0.966	0.04	0.252	0.13	0.832	1.10	0.483	0.02	2.446	3.00	0.048	0.00
006	0.763	0.16	0.166	0.12	1.096	0.08	0.174	0.03	1.104	0.52	0.548	0.04	1.096	0.08	0.324	0.35
007	0.453	0.01	0.227	0.00	1.700	0.26	0.238	0.02	0.625	0.58	0.566	0.01	1.132	0.02	0.193	0.12
008	0.522	0.18	0.258	0.30	1.260	0.07	0.208	0.11	0.630	0.04	0.525	0.03	1.050	0.06	0.119	0.13
009	0.514	0.02	0.257	0.01	1.284	0.05	0.333	0.04	0.582	0.41	0.642	0.03	1.284	0.05	0.064	0.00
010	0.584	0.17	0.236	0.03	1.293	0.08	0.274	0.10	0.946	0.11	0.591	0.07	1.182	0.14	0.131	0.14
011	0.651	0.02	0.544	0.23	2.170	0.06	0.513	0.43	0.490	0.34	0.543	0.02	1.085	0.03	0.152	0.05
012	2.040	2.64	1.680	1.44	2.520	1.20	0.888	1.10	1.320	0.24	0.600	0.00	1.800	1.20	0.300	[illegible]
013	0.996	999.99	0.498	999.99	2.739	999.99	0.573	999.99	1.245	999.99	0.622	999.99	1.245	999.99	0.349	999.99
014	0.761	0.05	0.254	0.02	2.789	0.19	0.457	0.08	0.892	0.31	0.634	0.04	1.268	0.08	0.122	0.12
015	0.449	0.03	0.167	0.10	0.891	0.39	0.167	0.06	0.337	0.02	0.562	0.04	1.124	0.08	0.094	0.07
016	0.961	0.17	0.175	0.00	1.660	0.87	0.384	0.03	0.874	0.00	0.437	0.00	0.874	0.00	0.044	0.00
017	0.438	0.02	0.163	0.10	0.871	0.40	0.184	0.15	0.328	0.01	0.547	0.02	1.094	0.05	0.055	0.00
018	0.369	0.03	0.184	0.01	1.010	0.11	0.203	0.05	0.276	0.02	0.461	0.03	0.921	0.07	0.079	0.07
019	0.432	0.02	0.322	0.20	1.190	0.27	0.290	0.10	0.600	0.56	0.540	0.02	1.080	0.05	0.054	0.00
020	0.970	0.01	0.243	0.16	0.970	0.01	0.243	0.10	1.050	0.15	0.404	0.01	0.808	0.01	0.040	0.00
021	0.578	0.20	0.458	0.44	1.621	0.37	0.405	0.14	0.811	0.19	0.581	0.03	1.163	0.07	0.109	0.10
022	0.459	0.03	0.229	0.02	1.147	0.08	0.195	0.04	0.621	0.53	0.573	0.04	1.147	0.08	0.057	[illegible]
023	0.489	0.05	0.850	0.16	4.134	0.59	1.164	0.28	0.367	0.03	0.611	0.06	1.223	0.11	0.119	[illegible]
024	0.492	0.09	0.179	0.09	0.872	0.40	0.195	0.01	1.005	0.66	0.615	0.11	1.230	0.21	0.386	0.46
025	0.344	999.99	0.172	999.99	0.860	999.99	0.310	999.99	0.258	999.99	0.430	999.99	0.860	999.99	0.043	999.99
026	0.508	0.02	0.127	0.00	1.015	0.04	0.178	0.01	0.761	0.03	0.634	0.02	1.269	0.05	0.228	0.04
027	0.288	0.11	0.203	0.06	0.577	0.21	0.119	0.07	0.518	0.33	0.360	0.13	0.721	0.26	0.138	0.13
028	0.415	0.02	0.309	0.19	3.311	0.26	0.288	0.19	0.576	0.54	0.518	0.02	1.036	0.05	0.110	0.12
030	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
031	0.449	0.02	0.167	0.10	1.351	0.51	0.191	0.08	0.336	0.02	0.561	0.03	1.121	0.05	0.116	0.12
032	0.487	0.03	0.487	0.03	1.461	0.09	0.478	0.25	0.365	0.02	0.609	0.04	1.218	0.08	0.061	0.00
033	0.391	0.07	0.143	0.07	1.279	0.41	0.196	0.03	0.428	0.22	0.489	0.08	0.978	0.17	0.156	0.03
034	0.420	0.00	0.210	0.00	0.945	0.21	0.189	0.08	0.578	0.53	0.525	0.00	1.050	0.00	0.131	0.16
035	0.386	0.25	0.195	0.13	1.034	0.03	0.233	0.06	0.584	0.40	0.646	0.02	1.293	0.03	0.097	0.07
036	0.459	0.00	0.172	0.12	0.688	0.00	0.183	0.04	0.344	0.00	0.573	0.00	1.146	0.01	0.183	0.04
037	0.321	0.20	0.325	0.23	0.752	0.19	0.182	0.06	0.487	0.34	0.538	0.02	1.076	0.04	0.112	0.11
038	0.500	0.18	0.299	0.19	3.519	0.02	0.490	0.24	0.302	0.02	0.503	0.03	1.006	0.05	0.050	0.00
039	0.380	0.01	0.142	0.09	1.331	0.03	0.208	0.19	0.285	0.01	0.475	0.01	0.950	0.02	0.048	0.00
040	0.373	0.01	0.373	0.01	1.119	0.02	0.336	0.12	0.421	0.29	0.466	0.01	0.932	0.02	0.047	0.00
041	0.564	0.23	0.169	0.12	1.015	0.24	0.203	0.00	0.901	0.01	0.563	0.01	1.126	0.02	0.282	0.12
042	0.283	0.19	0.094	0.00	1.037	0.21	0.150	0.03	0.282	0.01	0.471	0.01	0.941	0.02	0.047	0.00
043	0.742	0.01	0.432	0.12	2.133	0.16	0.376	0.23	0.865	0.24	0.541	0.15	1.081	0.29	0.115	0.11
044	0.415	0.06	0.208	0.03	1.453	0.21	0.316	0.17	0.311	0.04	0.519	0.08	1.038	0.15	0.052	0.01
045	0.423	0.00	0.317	0.21	2.962	0.44	0.391	0.11	0.687	0.74	0.529	0.00	1.058	0.01	0.211	0.13
080	1.034	0.01	0.172	0.00	2.325	0.50	0.362	0.07	1.120	0.17	0.431	0.00	0.861	0.00	0.043	0.00
081	1.910	0.22	0.454	0.17	2.727	0.05	0.772	0.18	1.910	0.22	0.455	0.01	1.818	0.04	0.045	0.00
082	0.864	0.38	0.260	0.18	1.289	0.12	0.180	0.04	0.864	0.38	0.430	0.02	0.860	0.03	0.205	0.10
083	0.953	0.01	0.095	0.00	1.619	0.17	0.191	0.08	1.047	0.18	0.476	0.01	0.953	0.01	0.362	0.00
Ar.Mean	0.619	0.17	0.314	0.18	1.550	0.24	0.322	0.13	0.684	0.27	0.530	0.03	1.123	0.16	0.137	[illegible]
Std.Dev.	0.351	0.40	0.263	0.29	0.817	0.24	0.199	0.17	0.340	0.26	0.069	0.03	0.283	0.47	0.099	0.12

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 8-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.021	0.00	5.315	0.28	5.315	0.28	0.213	0.01	38.379	10.55	0.106	0.01	0.87	2.79
002	0.024	0.00	5.968	0.35	5.968	0.35	0.239	0.01	32.470	18.59	0.119	0.01	1.51	4.92
003	0.019	0.00	4.841	0.32	4.841	0.32	0.194	0.01	35.727	3.45	0.097	0.01	0.35	0.90
004	0.019	0.00	4.658	0.53	7.734	5.63	0.538	0.68	39.270	23.41	0.093	0.01	2.34	6.23
005	0.799	1.56	4.828	0.21	25.056	40.67	4.041	7.70	30.040	10.96	0.097	0.00	4.83	10.82
006	0.022	0.00	5.479	0.41	5.479	0.41	0.219	0.02	22.160	14.79	0.110	0.01	1.22	3.91
007	0.023	0.00	5.663	0.10	5.663	0.10	0.341	0.23	14.712	2.00	0.113	0.00	0.25	0.53
008	0.021	0.00	5.250	0.30	5.250	0.30	0.312	0.19	15.960	21.12	0.105	0.01	1.63	5.61
009	0.026	0.00	6.420	0.27	6.420	0.27	0.257	0.01	42.564	19.77	0.128	0.01	1.50	5.26
010	0.024	0.00	5.909	0.70	5.909	0.70	0.459	0.42	28.645	12.81	0.118	0.01	1.11	3.38
011	0.043	0.04	5.425	0.15	14.090	1.78	0.538	0.64	45.600	5.60	0.108	0.00	0.67	1.49
012	1.056	2.06	6.000	0.00	21.600	4.80	1.680	0.00	93.600	86.40	0.120	0.00	7.23	22.83
013	0.025	999.99	6.225	999.99	6.225	999.99	0.249	999.99	87.150	999.99	0.125	999.99	999.99	999.99
014	0.025	0.00	6.337	0.42	6.337	0.42	0.384	0.28	47.195	20.89	0.127	0.01	1.64	5.54
015	0.022	0.00	5.619	0.40	5.619	0.40	0.225	0.02	49.283	5.46	0.112	0.01	0.51	1.43
016	0.017	0.00	4.369	0.01	4.369	0.01	0.175	0.00	41.066	8.63	0.087	0.00	0.70	2.30
017	0.022	0.00	5.470	0.23	5.470	0.23	0.219	0.01	30.817	18.81	0.109	0.00	1.43	5.00
018	0.018	0.00	4.606	0.34	4.606	0.34	0.184	0.01	39.378	10.00	0.092	0.01	0.79	2.65
019	0.022	0.00	5.400	0.23	5.400	0.23	0.216	0.01	51.840	2.16	0.108	0.00	0.27	0.57
020	0.016	0.00	4.040	0.06	4.040	0.06	0.162	0.00	46.930	20.05	0.081	0.00	1.47	5.35
021	0.115	0.09	5.813	0.33	12.028	12.10	0.911	1.34	36.875	21.17	0.116	0.01	2.61	6.21
022	0.023	0.00	5.735	0.40	5.735	0.40	0.229	0.02	38.131	18.70	0.115	0.01	1.45	4.97
023	0.024	0.00	6.112	0.57	13.685	14.57	0.245	0.02	97.455	5.47	0.122	0.01	1.58	4.00
024	0.025	0.00	6.149	1.07	6.149	1.07	0.380	0.31	18.553	5.68	0.123	0.02	0.73	1.47
025	0.017	999.99	4.300	999.99	4.300	999.99	0.172	999.99	30.960	999.99	0.086	999.99	999.99	999.99
026	0.025	0.00	6.344	0.24	6.344	0.24	0.254	0.01	35.430	8.82	0.127	0.00	0.68	2.34
027	0.014	0.01	3.604	1.32	3.604	1.32	0.315	0.39	33.593	5.76	0.072	0.03	0.72	1.51
028	0.021	0.00	5.181	0.24	16.580	0.76	0.313	0.22	18.795	13.29	0.104	0.00	1.14	3.50
030	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
031	0.022	0.00	5.606	0.26	5.606	0.26	0.224	0.01	44.798	2.39	0.112	0.01	0.28	0.62
032	0.024	0.00	6.088	0.38	6.088	0.38	0.495	0.52	48.625	1.87	0.122	0.01	0.26	0.49
033	0.020	0.00	4.888	0.83	4.888	0.83	0.285	0.15	13.390	16.18	0.098	0.02	1.36	4.27
034	0.021	0.00	5.250	0.00	16.275	22.05	0.210	0.00	46.200	21.00	0.105	0.00	3.14	7.79
035	0.026	0.00	6.462	0.17	6.462	0.17	0.258	0.01	18.908	25.07	0.129	0.00	1.89	6.67
036	0.023	0.00	5.731	0.04	5.731	0.04	0.229	0.00	20.648	9.31	0.115	0.00	0.69	2.48
037	0.022	0.00	5.381	0.19	5.381	0.19	0.215	0.01	16.125	1.59	0.108	0.00	0.23	0.41
038	0.020	0.00	5.030	0.26	10.421	10.52	0.201	0.01	42.357	10.22	0.101	0.01	1.55	3.74
039	0.019	0.00	4.752	0.09	4.752	0.09	0.190	0.00	15.189	3.51	0.095	0.00	0.29	0.93
040	0.019	0.00	4.663	0.07	4.663	0.07	0.187	0.00	53.145	1.01	0.093	0.00	0.12	0.27
041	0.045	0.05	5.631	0.09	5.631	0.09	0.678	0.46	28.060	24.34	0.113	0.00	1.84	6.48
042	0.019	0.00	4.707	0.10	4.707	0.10	0.188	0.00	25.448	6.21	0.094	0.00	0.49	1.65
043	0.093	0.04	5.405	1.47	12.407	12.53	0.870	1.25	58.671	20.24	0.108	0.03	2.63	6.04
044	0.021	0.00	5.188	0.75	12.406	13.69	0.208	0.03	35.875	21.70	0.104	0.02	2.64	6.57
045	0.021	0.00	5.288	0.03	16.920	0.08	0.317	0.21	29.610	0.14	0.106	0.00	0.15	0.21
080	0.017	0.00	4.307	0.02	12.059	0.06	0.172	0.00	46.509	3.20	0.086	0.00	0.29	0.85
081	0.018	0.00	4.545	0.09	14.564	3.93	0.182	0.00	88.027	29.15	0.091	0.00	2.43	7.76
082	0.017	0.00	4.301	0.17	4.301	0.17	0.509	0.67	40.550	13.65	0.086	0.00	1.14	3.61
083	0.019	0.00	4.764	0.06	4.764	0.06	0.570	0.37	29.564	9.89	0.095	0.00	0.77	2.63
r.Mean	0.064	0.09	5.299	0.32	8.124	3.40	0.422	0.36	39.240	13.67	0.106	0.01	1.36	3.98
Std.dev.	0.187	0.38	0.691	0.33	4.977	7.56	0.601	1.16	19.804	13.65	0.014	0.01	1.31	3.81

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 8-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011	BIRD DROPPINGS ON SCREEN		
012	GREEN ALGAE IN SAMPLE AND ON SCREEN		
013	VOMIT BALL ON SCREEN	VOID/VANDALISM	MISSING SAMPLE B
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024			
025	VOID/DEAD BIRD IN CONTAINER		MISSING SAMPLE A
026			
027			
028			
030	VOID/POSSIBLE CONTAMINATION	VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE A and B
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
082		LIQUID GREEN	
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 9-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

ocation Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
--------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------
001	0.955	0.08	0.095	0.01	0.473	0.15	0.073	0.05	0.955	0.08	0.477	0.04	0.955	0.08	0.048	0.00
002	0.803	0.01	0.100	0.00	0.602	0.00	0.050	0.00	0.802	0.40	0.502	0.00	1.003	0.01	0.126	0.15
003	1.041	0.16	0.116	0.01	1.393	0.09	0.186	0.01	1.161	0.08	0.581	0.04	1.161	0.08	0.058	0.00
004	0.671	0.65	0.292	0.41	0.847	0.03	0.093	0.02	1.090	1.14	0.424	0.02	0.847	0.03	0.042	0.00
005	0.435	0.00	0.109	0.00	0.435	0.00	0.054	0.00	0.598	0.54	0.544	0.00	1.088	0.01	0.054	0.00
006	0.738	0.19	0.106	0.00	1.054	0.39	0.100	0.09	0.950	0.18	0.529	0.02	1.057	0.04	0.159	0.03
007	0.184	0.03	0.092	0.02	0.635	0.07	0.071	0.06	0.275	0.05	0.459	0.08	0.918	0.16	0.075	0.05
008	0.360	0.02	0.090	0.01	0.632	0.22	0.099	0.02	0.270	0.02	0.449	0.03	0.899	0.06	0.105	0.12
009	0.532	0.22	0.106	0.00	0.851	0.01	0.091	0.08	0.479	0.32	0.532	0.00	1.064	0.01	0.053	0.00
010	0.717	0.04	0.090	0.01	0.625	0.14	0.045	0.00	0.717	0.04	0.448	0.03	0.897	0.05	0.045	0.00
011	0.375	999.99	0.094	999.99	2.060	999.99	0.206	999.99	0.562	999.99	0.468	999.99	0.936	999.99	0.243	999.99
012	2.255	999.99	3.156	999.99	2.255	999.99	0.383	999.99	2.705	999.99	0.564	999.99	6.764	999.99	0.158	999.99
013	0.216	0.02	0.108	0.01	1.172	0.53	0.273	0.28	0.324	0.03	0.540	0.05	1.080	0.10	0.054	0.01
014	1.235	0.22	0.112	0.00	1.347	0.01	0.112	0.00	1.347	0.01	0.561	0.00	1.123	0.00	0.056	0.00
015	0.111	0.00	0.111	0.00	0.665	0.01	0.055	0.00	0.332	0.00	0.554	0.01	1.108	0.01	0.055	0.00
016	1.222	0.26	0.111	0.00	0.997	0.19	0.111	0.00	1.109	0.04	0.555	0.02	1.109	0.04	0.055	0.00
017	0.296	0.23	0.097	0.01	0.580	0.07	0.048	0.01	0.290	0.04	0.483	0.06	0.966	0.12	0.048	0.01
018	0.502	0.03	0.084	0.00	0.502	0.03	0.042	0.00	0.502	0.03	0.418	0.02	0.836	0.05	0.042	0.00
019	0.750	0.05	0.142	0.10	1.034	0.25	0.256	0.22	0.750	0.05	0.469	0.03	0.938	0.06	0.047	0.00
020	3.474	0.22	1.542	2.89	0.993	0.40	0.258	0.32	3.672	0.22	0.496	0.00	2.980	2.00	0.050	0.00
021	0.385	0.01	0.096	0.00	0.483	0.20	0.048	0.00	0.432	0.28	0.482	0.01	0.964	0.02	0.135	0.07
022	0.144	0.12	0.094	0.02	0.562	0.09	0.047	0.01	0.281	0.05	0.468	0.08	0.936	0.15	0.047	0.01
023	0.461	0.00	0.173	0.12	1.729	0.24	0.300	0.32	0.518	0.34	0.576	0.00	1.152	0.00	0.098	0.08
024	0.150	0.11	0.098	0.01	0.858	0.89	0.082	0.06	0.294	0.03	0.490	0.05	0.981	0.10	0.049	0.00
025	0.200	0.01	0.100	0.00	1.104	0.25	0.110	0.03	0.300	0.01	0.501	0.02	1.001	0.05	0.050	0.00
026	0.279	0.19	0.093	0.00	0.557	0.37	0.046	0.00	0.279	0.00	0.465	0.00	0.930	0.00	0.046	0.00
027	0.316	0.19	0.107	0.01	0.434	0.46	0.053	0.00	0.473	0.28	0.533	0.04	1.065	0.08	0.053	0.00
028	0.089	0.01	0.089	0.01	1.064	0.11	0.107	0.05	0.266	0.03	0.443	0.05	0.886	0.09	0.160	0.02
030	1.960	1.78	0.970	1.73	3.298	3.18	0.780	1.01	1.178	1.72	0.522	0.03	3.589	5.04	0.327	0.29
031	0.165	0.12	0.109	0.01	0.976	0.17	0.091	0.07	0.326	0.02	0.544	0.03	1.088	0.06	0.196	0.05
032	0.413	999.99	0.103	999.99	0.619	999.99	0.144	999.99	0.309	999.99	0.516	999.99	1.031	999.99	0.052	999.99
033	0.098	0.01	0.098	0.01	0.572	0.31	0.049	0.01	0.293	0.04	0.488	0.07	0.976	0.13	0.117	0.13
034	0.140	0.07	0.095	0.01	0.573	0.09	0.048	0.01	0.286	0.04	0.477	0.07	0.955	0.15	0.094	0.10
035	0.110	0.00	0.110	0.00	0.661	0.01	0.055	0.00	0.331	0.01	0.551	0.01	1.102	0.02	0.055	0.00
036	0.098	0.01	0.098	0.01	0.390	0.03	0.049	0.00	0.293	0.02	0.488	0.03	0.976	0.07	0.101	0.10
037	0.103	0.01	0.103	0.01	0.410	0.03	0.051	0.00	0.308	0.03	0.513	0.04	1.026	0.08	0.051	0.00
038	0.090	0.00	0.090	0.00	0.540	0.00	0.045	0.00	0.270	0.00	0.450	0.00	0.900	0.00	0.076	0.06
039	0.090	0.00	0.090	0.00	0.449	0.17	0.045	0.00	0.270	0.01	0.450	0.01	0.900	0.02	0.104	0.12
040	0.101	0.01	0.101	0.01	0.809	0.05	0.101	0.01	0.303	0.02	0.506	0.03	1.011	0.07	0.051	0.00
041	0.429	0.14	0.086	0.01	0.601	0.13	0.072	0.06	0.467	0.40	0.432	0.03	0.864	0.06	0.106	0.12
042	0.097	0.01	0.097	0.01	0.387	0.05	0.098	0.09	0.290	0.04	0.484	0.07	0.968	0.14	0.089	0.07
043	0.760	0.12	0.161	0.09	1.638	0.00	0.322	0.18	1.082	0.29	0.548	0.07	1.097	0.15	0.055	0.01
044	0.098	0.00	0.098	0.00	0.586	0.03	0.049	0.00	0.293	0.01	0.488	0.02	0.976	0.05	0.049	0.00
045	0.294	0.19	0.098	0.00	1.866	0.23	0.157	0.00	0.440	0.29	0.491	0.01	0.982	0.02	0.122	0.15
080	1.301	0.05	0.101	0.01	1.112	0.33	0.121	0.01	1.407	0.17	0.502	0.06	1.005	0.12	0.050	0.01
081	4.137	0.33	0.212	0.01	2.545	0.07	0.572	0.03	4.238	0.30	0.530	0.02	4.241	0.12	0.053	0.00
082	1.727	0.11	0.091	0.00	1.998	0.28	0.337	0.03	1.727	0.11	0.455	0.02	0.910	0.04	0.046	0.00
083	1.665	0.23	0.098	0.00	0.979	0.02	0.127	0.06	1.861	0.23	0.489	0.01	0.979	0.02	0.128	0.06
r.Mean	0.683	0.14	0.221	0.12	0.978	0.23	0.140	0.07	0.786	0.18	0.499	0.03	1.275	0.22	0.086	0.04
Std.Dev.	0.849	0.28	0.495	0.50	0.631	0.48	0.145	0.16	0.843	0.31	0.042	0.02	1.042	0.79	0.058	0.06

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 9-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.019	0.00	4.773	0.41	4.773	0.41	0.191	0.02	4.773	0.41	0.095	0.01	0.13	0.16
002	0.020	0.00	5.017	0.03	5.017	0.03	0.201	0.00	7.534	5.07	0.100	0.00	0.41	1.35
003	0.023	0.00	5.806	0.39	5.806	0.39	0.232	0.02	10.006	8.79	0.116	0.01	0.72	2.33
004	0.017	0.00	4.237	0.17	4.237	0.17	0.169	0.01	7.265	6.23	0.085	0.00	0.64	1.64
005	0.022	0.00	5.438	0.03	5.438	0.03	0.218	0.00	5.438	0.03	0.109	0.00	0.05	0.14
006	0.021	0.00	5.288	0.18	5.288	0.18	0.211	0.01	5.288	0.18	0.106	0.00	0.10	0.11
007	0.018	0.00	4.591	0.82	4.591	0.82	0.184	0.03	4.591	0.82	0.092	0.02	0.22	0.33
008	0.018	0.00	4.494	0.28	4.494	0.28	0.180	0.01	7.740	6.78	0.090	0.01	0.56	1.79
009	0.021	0.00	5.318	0.05	5.318	0.05	0.213	0.00	5.318	0.05	0.106	0.00	0.06	0.10
010	0.018	0.00	4.483	0.26	4.483	0.26	0.179	0.01	4.483	0.26	0.090	0.01	0.08	0.11
011	0.187	999.99	4.682	999.99	4.682	999.99	0.187	999.99	13.109	999.99	0.094	999.99	999.99	999.99
012	2.029	999.99	5.636	999.99	45.091	999.99	9.920	999.99	18.036	999.99	0.113	999.99	999.99	999.99
013	0.096	0.06	5.398	0.52	5.398	0.52	0.216	0.02	19.223	6.75	0.108	0.01	0.64	1.77
014	0.022	0.00	5.613	0.02	5.613	0.02	0.225	0.00	5.613	0.02	0.112	0.00	0.02	0.06
015	0.022	0.00	5.540	0.06	5.540	0.06	0.222	0.00	5.540	0.06	0.111	0.00	0.01	0.02
016	0.022	0.00	5.547	0.18	5.547	0.18	0.222	0.01	11.095	0.36	0.166	0.11	0.10	0.12
017	0.019	0.00	4.830	0.61	4.830	0.61	0.193	0.02	4.830	0.61	0.097	0.01	0.17	0.25
018	0.017	0.00	4.182	0.23	4.182	0.23	0.167	0.01	4.182	0.23	0.084	0.00	0.06	0.09
019	0.046	0.05	4.688	0.28	4.688	0.28	0.188	0.01	19.886	14.32	0.094	0.01	1.12	3.80
020	0.229	0.42	4.963	0.02	24.365	38.83	0.795	1.19	17.885	15.97	0.099	0.00	4.46	10.74
021	0.048	0.06	4.818	0.09	4.818	0.09	0.765	1.14	7.205	4.68	0.096	0.00	0.48	1.25
022	0.019	0.00	4.682	0.77	4.682	0.77	0.187	0.03	7.689	5.24	0.094	0.02	0.53	1.38
023	0.058	0.07	5.761	0.02	5.761	0.02	0.345	0.23	24.811	38.12	0.115	0.00	2.83	10.16
024	0.020	0.00	4.903	0.49	4.903	0.49	0.196	0.02	14.661	0.50	0.098	0.01	0.20	0.28
025	0.020	0.00	5.006	0.24	5.006	0.24	0.200	0.01	11.036	2.53	0.100	0.00	0.24	0.66
026	0.019	0.00	4.648	0.02	4.648	0.02	0.186	0.00	9.295	0.05	0.093	0.00	0.05	0.11
027	0.021	0.00	5.325	0.40	5.325	0.40	0.213	0.02	9.938	8.82	0.107	0.01	0.77	2.33
028	0.018	0.00	4.432	0.45	4.432	0.45	0.177	0.02	14.182	1.45	0.089	0.01	0.20	0.39
030	0.703	1.36	5.216	0.25	9.798	8.91	2.041	3.66	51.709	35.05	0.104	0.01	4.57	9.10
031	0.022	0.00	5.438	0.28	5.438	0.28	0.218	0.01	12.323	13.49	0.109	0.01	1.04	3.58
032	0.021	999.99	5.156	999.99	5.156	999.99	0.206	999.99	20.625	999.99	0.103	999.99	999.99	999.99
033	0.020	0.00	4.881	0.67	4.881	0.67	0.195	0.03	7.488	5.88	0.098	0.01	0.57	1.55
034	0.038	0.01	4.773	0.73	4.773	0.73	0.191	0.03	4.773	0.73	0.095	0.01	0.20	0.29
035	0.022	0.00	5.511	0.11	5.511	0.11	0.220	0.00	5.511	0.11	0.110	0.00	0.03	0.05
036	0.020	0.00	4.881	0.33	4.881	0.33	0.195	0.01	4.881	0.33	0.098	0.01	0.09	0.13
037	0.021	0.00	5.131	0.42	5.131	0.42	0.205	0.02	7.801	5.76	0.250	0.29	0.51	1.52
038	0.018	0.00	4.500	0.00	4.500	0.00	0.180	0.00	4.500	0.00	0.090	0.00	0.00	0.02
039	0.018	0.00	4.500	0.09	4.500	0.09	0.180	0.00	4.500	0.09	0.090	0.00	0.04	0.06
040	0.020	0.00	5.057	0.34	5.057	0.34	0.202	0.01	9.761	9.75	0.101	0.01	0.76	2.59
041	0.017	0.00	4.318	0.32	4.318	0.32	0.173	0.01	20.855	8.44	0.086	0.01	0.72	2.23
042	0.019	0.00	4.841	0.68	4.841	0.68	0.194	0.03	9.791	9.22	0.097	0.01	0.79	2.44
043	0.022	0.00	5.483	0.74	5.483	0.74	0.219	0.03	23.534	14.30	0.110	0.01	1.19	3.78
044	0.020	0.00	4.881	0.24	4.881	0.24	0.195	0.01	4.881	0.24	0.098	0.00	0.06	0.10
045	0.020	0.00	4.909	0.09	4.909	0.09	0.196	0.00	14.755	6.16	0.098	0.00	0.52	1.63
080	0.020	0.00	5.025	0.60	5.025	0.60	0.201	0.02	5.025	0.60	0.101	0.01	0.19	0.24
081	0.021	0.00	5.302	0.16	5.302	0.16	0.212	0.01	47.700	0.72	0.106	0.00	0.14	0.20
082	0.018	0.00	4.550	0.20	4.550	0.20	0.182	0.01	26.450	6.62	0.091	0.00	0.54	1.75
083	0.020	0.00	4.894	0.09	4.894	0.09	0.196	0.00	12.169	14.46	0.098	0.00	1.09	3.85
Ar.Mean	0.088	0.05	4.986	0.30	6.308	1.35	0.466	0.15	12.077	5.78	0.104	0.01	0.62	1.70
Std.dev.	0.305	0.21	0.418	0.24	6.410	5.86	1.423	0.59	10.034	8.26	0.025	0.04	0.98	2.53

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 9-91

DEPOSITION DATA

Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011	VOID/VANDALISM		MISSING SAMPLE A
012	VOID/POSSIBLE CONTAMINATION	SCREEN MISSING	MISSING SAMPLE A
013			
014			
015			
016			
017			
018			
019			
020	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
021			
022			
023			
024	BIRD DROPPINGS ON SCREEN		
025		BIRD DROPPINGS ON SCREEN	
026			
027			
028			
030	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
031			
032	VOID/POSSIBLE CONTAMINATION		MISSING SAMPLE A
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	BIRD DROPPINGS ON SCREEN		
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 10-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.575	0.20	0.175	0.12	0.807	0.19	0.185	0.01	0.347	0.02	0.578	0.03	1.156	0.06	0.058	0.00
002	0.479	0.00	0.120	0.00	0.839	0.24	0.060	0.00	0.360	0.00	0.599	0.00	1.199	0.00	0.060	0.00
003	0.567	0.18	0.229	0.02	2.278	0.24	0.580	0.11	0.343	0.03	0.572	0.05	1.144	0.11	0.057	0.01
004	0.658	0.36	0.478	0.72	1.087	0.23	0.093	0.07	1.085	1.45	0.474	0.25	0.948	0.50	0.130	0.02
005	0.411	0.04	0.103	0.01	0.920	0.12	0.113	0.01	0.456	0.27	0.514	0.05	1.028	0.09	0.051	0.00
006	0.564	0.23	0.169	0.11	1.127	0.00	0.214	0.16	0.676	0.00	0.564	0.00	1.127	0.00	0.084	0.06
007	0.183	0.12	0.122	0.00	1.466	0.01	0.104	0.09	0.366	0.00	0.611	0.00	1.221	0.01	0.061	0.00
008	0.347	0.22	0.116	0.01	0.699	0.03	0.058	0.00	0.350	0.02	0.583	0.03	1.165	0.05	0.058	0.00
009	0.540	0.01	0.135	0.00	0.944	0.25	0.176	0.08	0.405	0.01	0.675	0.02	1.350	0.03	0.068	0.00
010	0.502	0.01	0.125	0.00	1.003	0.01	0.138	0.02	0.376	0.01	0.627	0.01	1.254	0.02	0.063	0.00
011	0.240	0.01	0.120	0.00	0.842	0.27	0.091	0.06	0.360	0.01	0.600	0.02	1.200	0.04	0.060	0.00
012	0.935	0.47	0.526	0.82	0.818	0.24	0.099	0.08	0.526	0.35	0.584	0.00	1.169	0.00	0.058	0.00
013	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
014	1.034	0.03	0.129	0.00	1.420	0.21	0.109	0.09	1.034	0.03	0.646	0.02	1.293	0.04	0.065	0.00
015	0.127	0.00	0.127	0.00	0.763	0.01	0.064	0.00	0.381	0.00	0.636	0.01	1.271	0.01	0.064	0.00
016	0.532	0.24	0.158	0.10	2.020	0.74	0.390	0.09	0.739	0.17	0.530	0.03	1.059	0.05	0.141	0.17
017	0.091	0.07	0.060	0.01	0.151	0.07	0.039	0.02	0.090	0.01	0.149	0.01	0.299	0.03	0.015	0.00
018	0.462	0.03	0.116	0.01	0.462	0.03	0.058	0.00	0.347	0.02	0.578	0.04	1.155	0.08	0.058	0.00
019	0.953	0.44	0.120	0.00	0.718	0.03	0.143	0.04	0.957	0.03	0.598	0.02	1.196	0.04	0.060	0.00
020	2.633	0.09	0.219	0.01	0.766	0.19	0.164	0.10	2.960	0.12	0.548	0.02	2.194	0.07	0.093	0.07
021	0.315	0.38	0.125	0.00	0.626	0.24	0.063	0.00	0.376	0.01	0.627	0.01	1.254	0.02	0.063	0.00
022	0.472	0.45	0.120	0.01	0.718	0.04	0.089	0.05	0.650	0.56	0.598	0.03	1.196	0.07	0.100	[illegible]
023	0.792	0.04	0.657	0.23	2.898	0.40	0.938	0.12	0.868	0.96	0.660	0.03	1.320	0.06	0.194	[illegible]
024	0.181	0.13	0.119	0.01	0.946	0.41	0.119	0.01	0.358	0.03	0.596	0.04	1.193	0.08	0.060	0.00
025	0.173	0.12	0.173	0.12	0.908	0.88	0.114	0.00	0.343	0.01	0.572	0.02	1.144	0.04	0.057	0.00
026	0.226	0.01	0.113	0.00	0.794	0.25	0.057	0.00	0.339	0.01	0.566	0.02	1.131	0.04	0.057	0.00
027	0.449	0.04	0.112	0.01	1.014	0.31	0.135	0.01	0.336	0.03	0.561	0.05	1.121	0.10	0.094	0.07
028	0.283	0.34	0.338	0.23	1.013	0.24	0.056	0.00	0.337	0.01	0.562	0.01	1.124	0.02	0.056	0.00
030	0.747	999.99	1.743	999.99	3.735	999.99	0.573	999.99	1.992	999.99	0.622	999.99	1.245	999.99	0.274	999.99
031	0.269	0.01	0.613	0.96	5.592	9.60	0.621	1.11	0.403	0.02	0.671	0.03	1.342	0.05	0.067	0.00
032	0.386	0.25	0.129	0.00	0.774	0.02	0.096	0.06	0.578	0.37	0.645	0.02	1.290	0.03	0.135	0.14
033	0.379	0.28	0.124	0.01	0.616	0.19	0.062	0.01	0.568	0.42	0.622	0.06	1.244	0.11	0.137	0.04
034	0.233	0.01	0.117	0.01	0.586	0.26	0.058	0.00	0.350	0.02	0.583	0.03	1.166	0.06	0.058	0.00
035	0.205	0.14	0.136	0.00	0.682	0.30	0.068	0.00	0.408	0.01	0.680	0.02	1.360	0.05	0.068	0.00
036	0.119	0.01	0.180	0.13	1.055	0.64	0.059	0.00	0.356	0.02	0.593	0.04	1.185	0.07	0.139	0.16
037	0.304	0.35	0.125	0.01	0.499	0.04	0.062	0.01	0.374	0.03	0.624	0.05	1.248	0.10	0.062	0.01
038	0.154	0.09	0.105	0.01	0.737	0.28	0.080	0.06	0.314	0.03	0.523	0.05	1.046	0.10	0.052	0.01
039	0.264	0.00	0.132	0.00	0.791	0.01	0.066	0.00	0.395	0.00	0.659	0.01	1.318	0.01	0.066	0.00
040	0.127	0.00	0.127	0.00	1.012	0.01	0.177	0.05	0.380	0.00	0.633	0.01	1.265	0.01	0.063	0.00
041	0.322	0.21	0.108	0.00	0.860	0.02	0.054	0.00	0.322	0.01	0.538	0.01	1.075	0.02	0.091	0.07
042	0.367	0.26	0.121	0.01	0.728	0.03	0.090	0.06	0.364	0.02	0.607	0.03	1.214	0.05	0.061	0.00
043	0.938	0.22	0.531	0.51	1.745	0.18	0.228	0.07	1.345	0.07	0.672	0.04	1.345	0.07	0.067	0.00
044	0.372	0.26	0.123	0.00	0.740	0.02	0.173	0.00	0.370	0.01	0.617	0.01	1.234	0.03	0.062	0.00
045	0.245	0.01	0.185	0.13	3.067	0.85	0.259	0.18	0.367	0.01	0.612	0.02	1.224	0.05	0.208	0.02
080	0.849	0.07	0.106	0.01	1.699	0.14	0.258	0.19	0.840	0.35	0.531	0.04	1.062	0.09	0.053	0.00
081	1.408	0.13	0.217	0.01	1.842	0.10	0.326	0.02	1.519	0.09	0.543	0.03	1.085	0.07	0.054	0.00
082	2.472	0.04	0.308	0.20	3.397	0.56	0.494	0.20	2.368	0.17	0.515	0.01	2.060	0.03	0.140	0.18
083	1.284	0.09	0.107	0.01	1.705	0.31	0.235	0.02	1.166	0.56	0.535	0.04	1.070	0.07	0.190	0.16
Ar.Mean	0.557	0.15	0.222	0.10	1.275	0.42	0.181	0.07	0.650	0.14	0.584	0.03	1.213	0.06	0.086	[illegible]
Std.Dev.	0.524	0.14	0.267	0.22	1.007	1.40	0.185	0.17	0.568	0.28	0.081	0.04	0.252	0.07	0.050	0.0[illegible]

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 10-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.023	0.00	5.781	0.29	5.781	0.29	0.231	0.01	11.114	10.95	0.116	0.01	0.87	2.90
002	0.024	0.00	5.994	0.01	5.994	0.01	0.240	0.00	5.994	0.01	0.120	0.00	0.02	0.06
003	0.023	0.00	5.722	0.53	5.722	0.53	0.229	0.02	35.634	10.18	0.114	0.01	0.86	2.69
004	0.019	0.01	4.740	2.52	4.740	2.52	0.190	0.10	10.657	9.31	0.130	0.02	1.29	2.47
005	0.021	0.00	5.139	0.46	5.139	0.46	0.206	0.02	5.139	0.46	0.103	0.01	0.14	0.18
006	0.045	0.04	5.637	0.02	5.637	0.02	0.225	0.00	19.758	28.27	0.113	0.00	2.07	7.54
007	0.037	0.02	6.106	0.04	6.106	0.04	0.244	0.00	6.106	0.04	0.122	0.00	0.03	0.04
008	0.023	0.00	5.825	0.27	5.825	0.27	0.233	0.01	5.825	0.27	0.116	0.01	0.09	0.12
009	0.027	0.00	6.750	0.15	6.750	0.15	0.270	0.01	16.988	20.63	0.135	0.00	1.52	5.50
010	0.025	0.00	6.269	0.09	6.269	0.09	0.251	0.00	9.381	6.14	0.125	0.00	0.46	1.64
011	0.024	0.00	6.000	0.22	6.000	0.22	0.240	0.01	6.000	0.22	0.120	0.00	0.08	0.10
012	0.339	0.49	5.844	0.01	5.844	0.01	0.351	0.23	9.939	8.20	0.117	0.00	0.78	2.15
013	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
014	0.026	0.00	6.463	0.20	6.463	0.20	0.259	0.01	9.644	6.16	0.129	0.00	0.50	1.63
015	0.025	0.00	6.356	0.06	6.356	0.06	0.254	0.00	6.356	0.06	0.127	0.00	0.02	0.03
016	0.021	0.00	5.295	0.27	9.939	9.01	0.212	0.01	28.459	9.12	0.106	0.01	1.43	3.24
017	0.006	0.00	1.494	0.14	1.494	0.14	0.060	0.01	2.275	1.70	0.030	0.00	0.16	0.45
018	0.023	0.00	5.775	0.40	5.775	0.40	0.231	0.02	5.775	0.40	0.116	0.01	0.10	0.16
019	0.024	0.00	5.981	0.21	5.981	0.21	0.239	0.01	11.269	10.36	0.120	0.00	0.82	2.75
020	0.022	0.00	5.484	0.19	5.484	0.19	0.219	0.01	17.883	24.61	0.110	0.00	1.83	6.56
021	0.025	0.00	6.269	0.09	6.269	0.09	0.251	0.00	10.688	8.92	0.125	0.00	0.70	2.37
022	0.024	0.00	5.981	0.34	5.981	0.34	0.239	0.01	5.981	0.34	0.120	0.01	0.17	0.19
023	0.053	0.06	6.600	0.30	6.600	0.30	0.399	0.28	75.330	11.34	0.132	0.01	1.03	2.98
024	0.120	0.06	5.963	0.42	5.963	0.42	0.239	0.02	5.963	0.42	0.119	0.01	0.15	0.18
025	0.023	0.00	5.719	0.19	5.719	0.19	0.229	0.01	10.950	10.65	0.114	0.00	0.87	2.82
026	0.023	0.00	5.656	0.19	5.656	0.19	0.226	0.01	5.656	0.19	0.113	0.00	0.06	0.09
027	0.022	0.00	5.607	0.48	5.607	0.48	0.224	0.02	9.364	7.03	0.112	0.01	0.62	1.85
028	0.112	0.09	5.619	0.11	5.619	0.11	0.225	0.00	5.619	0.11	0.112	0.00	0.09	0.11
030	0.349	999.99	6.225	999.99	17.430	999.99	0.249	999.99	17.430	999.99	0.125	999.99	999.99	999.99
031	0.027	0.00	6.712	0.25	22.439	31.70	0.405	0.28	59.361	105.55	0.134	0.01	10.68	28.61
032	0.026	0.00	6.450	0.15	6.450	0.15	0.258	0.01	6.450	0.15	0.129	0.00	0.10	0.11
033	0.025	0.00	6.219	0.56	6.219	0.56	0.249	0.02	6.219	0.56	0.124	0.01	0.20	0.23
034	0.023	0.00	5.831	0.31	5.831	0.31	0.233	0.01	5.831	0.31	0.117	0.01	0.10	0.13
035	0.096	0.14	6.800	0.25	6.800	0.25	0.272	0.01	6.800	0.25	0.136	0.00	0.10	0.11
036	0.024	0.00	5.925	0.38	5.925	0.38	0.237	0.01	5.925	0.38	0.119	0.01	0.16	0.20
037	0.025	0.00	6.238	0.52	6.238	0.52	0.250	0.02	6.238	0.52	0.125	0.01	0.16	0.22
038	0.021	0.00	5.231	0.51	12.694	14.41	0.209	0.02	5.231	0.51	0.105	0.01	1.15	3.82
039	0.026	0.00	6.588	0.05	6.588	0.05	0.264	0.00	6.588	0.05	0.132	0.00	0.01	0.02
040	0.025	0.00	6.325	0.05	6.325	0.05	0.253	0.00	10.735	8.77	0.127	0.00	0.64	2.34
041	0.022	0.00	5.375	0.10	5.375	0.10	0.215	0.00	5.375	0.10	0.108	0.00	0.05	0.06
042	0.072	0.09	6.069	0.26	6.069	0.26	0.243	0.01	6.069	0.26	0.121	0.01	0.10	0.11
043	0.053	0.05	6.725	0.35	6.725	0.35	0.400	0.25	6.725	0.35	0.134	0.01	0.18	0.16
044	0.025	0.00	6.169	0.14	6.169	0.14	0.247	0.01	9.288	6.38	0.123	0.00	0.50	1.69
045	0.049	0.05	6.119	0.24	17.133	0.66	0.245	0.01	14.228	16.46	0.122	0.00	1.34	4.36
080	0.021	0.00	5.309	0.45	17.916	4.86	0.212	0.02	13.605	17.04	0.106	0.01	1.66	4.60
081	0.022	0.00	5.426	0.33	15.193	0.92	0.217	0.01	19.600	5.53	0.109	0.01	0.52	1.46
082	0.021	0.00	5.150	0.08	17.487	5.90	0.206	0.00	35.913	34.45	0.103	0.00	2.99	9.19
083	0.021	0.00	5.350	0.36	5.350	0.36	0.214	0.01	17.191	5.44	0.107	0.01	0.53	1.42
Ar.Mean	0.046	0.02	5.836	0.29	7.640	1.72	0.245	0.03	13.161	8.46	0.117	0.01	0.82	2.38
Std.dev.	0.068	0.08	0.806	0.37	4.286	5.22	0.055	0.07	13.803	16.75	0.016	0.00	1.62	4.51

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 10-91

DEPOSITION DATA
Comments and Messages Only

Page

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004	SCREEN MISSING		
005			
006			
007			
008			
009			
010			
011			
012			
013	VOID/VANDALISM	VOID/VANDALISM	MISSING SAMPLE A and
014			
015			
016			
017	LIQUID SPILLED WHEN JAR OVERTURNED	LIQUID SPILLED WHEN JAR OVERTURNED	
018			
019			
020			
021			
022			
023			
024			
025			
026			
027			
028			
030	VOID/POSSIBLE CONTAMINATION	SCREEN MISSING	MISSING SAMPLE A
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
044			
045			
080			
081			
082		LIQUID GREEN	
083			

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 11-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

cation Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.546	0.05	0.202	0.12	1.633	0.13	0.354	0.02	1.021	0.04	0.341	0.03	0.683	0.06	0.103	0.13
002	0.515	0.08	0.297	0.04	1.405	0.04	0.386	0.05	0.950	0.32	0.371	0.05	0.742	0.10	0.172	0.07
003	0.758	0.02	0.379	0.01	2.274	0.07	0.636	0.15	1.137	0.04	0.474	0.02	0.948	0.03	0.089	0.08
004	0.504	0.11	0.284	0.27	1.007	0.21	0.303	0.04	0.932	0.36	0.362	0.03	0.723	0.05	0.166	0.03
005	0.548	0.05	0.183	0.02	1.183	0.08	0.346	0.01	0.818	0.11	0.457	0.04	0.913	0.08	0.154	0.04
006	0.698	0.04	0.174	0.01	1.739	0.24	0.425	0.13	1.041	0.28	0.436	0.03	1.294	0.79	0.252	0.04
007	0.436	0.04	0.145	0.01	1.379	0.03	0.320	0.03	0.797	0.08	0.364	0.03	0.727	0.06	0.115	0.05
008	0.622	0.05	0.155	0.01	1.393	0.20	0.366	0.08	1.014	0.24	0.389	0.03	0.777	0.06	0.132	0.19
009	0.378	0.01	0.188	0.12	1.324	0.09	0.328	0.02	0.695	0.14	0.315	0.01	0.631	0.02	0.032	0.00
010	0.542	0.08	0.135	0.02	1.345	0.07	0.285	0.07	1.011	0.01	0.339	0.05	0.677	0.10	0.089	0.03
011	0.713	0.22	0.548	0.11	1.973	0.35	1.013	0.34	1.035	0.57	0.394	0.04	0.788	0.07	0.251	0.01
012	0.680	0.09	0.680	0.09	2.030	0.01	0.745	0.01	1.015	0.01	0.340	0.04	0.680	0.09	0.209	0.01
013	0.552	0.14	0.392	0.46	1.500	0.12	0.660	0.58	0.788	0.30	0.395	0.01	1.180	0.76	0.039	0.00
014	0.612	0.23	0.228	0.13	1.627	0.05	0.394	0.03	1.005	0.03	0.389	0.05	0.777	0.10	0.039	0.00
015	0.463	0.02	0.233	0.16	1.235	0.05	0.380	0.16	0.926	0.04	0.386	0.02	0.772	0.03	0.039	0.00
016	0.707	0.19	0.193	0.23	1.484	0.41	0.397	0.22	1.338	0.53	0.392	0.02	1.184	0.83	0.292	0.15
017	0.385	0.12	0.118	0.09	1.242	0.11	0.270	0.05	0.850	0.08	0.388	0.03	0.776	0.07	0.116	0.16
018	0.608	0.24	0.227	0.13	1.614	0.03	0.457	0.13	1.151	0.02	0.385	0.04	0.770	0.09	0.122	0.16
019	0.638	0.00	0.319	0.00	1.595	0.01	0.511	0.03	0.877	0.15	0.399	0.00	0.798	0.00	0.108	0.14
020	1.065	0.08	0.355	0.03	1.329	0.08	0.417	0.01	1.684	0.06	0.444	0.03	1.776	0.13	0.150	0.21
021	0.404	0.10	0.194	0.09	1.135	0.14	0.255	0.06	1.109	0.80	0.336	0.08	0.673	0.16	0.216	0.17
022	0.372	0.04	0.124	0.01	0.993	0.09	0.286	0.05	0.680	0.06	0.310	0.03	0.620	0.06	0.093	0.12
023	0.659	0.03	1.395	0.44	4.933	0.78	2.461	0.89	0.989	0.04	0.412	0.02	0.824	0.03	0.138	0.20
024	0.490	0.11	0.281	0.02	1.551	0.37	0.437	0.11	0.840	0.24	0.352	0.02	0.703	0.04	0.080	0.09
025	0.364	0.24	0.242	0.24	1.394	0.83	0.345	0.22	0.608	0.01	0.304	0.01	0.608	0.01	0.030	0.00
026	0.579	0.02	0.289	0.01	1.668	0.49	0.522	0.11	1.084	0.11	0.362	0.01	0.723	0.03	0.097	0.12
027	0.483	0.06	0.161	0.02	1.118	0.19	0.280	0.05	0.720	0.07	0.403	0.05	0.806	0.10	0.176	0.01
028	0.582	0.32	0.942	1.32	2.107	0.03	0.444	0.10	0.908	0.40	0.331	0.05	1.585	1.76	0.250	0.02
030	0.795	999.99	0.955	999.99	2.545	999.99	0.843	999.99	1.273	999.99	0.398	999.99	1.591	999.99	0.239	999.99
031	0.459	0.31	0.153	0.00	0.916	0.01	0.252	0.02	0.688	0.16	0.382	0.00	0.764	0.01	0.153	0.00
032	0.471	0.03	0.390	0.13	1.175	0.07	0.439	0.03	0.634	0.36	0.393	0.03	0.785	0.06	0.039	0.00
033	0.489	0.13	0.140	0.00	1.189	0.11	0.336	0.04	0.769	0.12	0.350	0.01	0.700	0.02	0.161	0.05
034	0.665	0.21	0.302	0.32	1.401	0.29	0.396	0.02	0.960	0.24	0.368	0.04	0.735	0.07	0.185	0.06
035	0.529	0.35	0.353	0.00	1.146	0.18	0.388	0.07	0.882	0.00	0.441	0.00	0.882	0.00	0.110	0.13
036	0.262	0.02	0.200	0.15	1.374	0.00	0.290	0.08	0.849	0.05	0.328	0.03	0.656	0.06	0.170	0.01
037	0.570	0.33	0.282	0.02	1.203	0.24	0.346	0.01	0.706	0.06	0.353	0.03	0.706	0.06	0.086	0.10
038	0.288	999.99	0.144	999.99	0.865	999.99	0.202	999.99	0.576	999.99	0.360	999.99	0.720	999.99	0.101	999.99
039	0.346	0.16	0.138	0.01	0.754	0.10	0.184	0.09	0.550	0.03	0.344	0.02	0.688	0.04	0.091	0.11
040	0.595	0.10	0.201	0.14	1.062	0.06	0.373	0.10	1.130	0.19	0.332	0.02	0.664	0.04	0.093	0.02
041	0.562	0.00	0.210	0.14	1.334	0.13	0.302	0.10	0.843	0.01	0.351	0.00	0.702	0.00	0.162	0.07
042	0.556	0.05	0.103	0.06	1.313	0.30	0.270	0.02	1.040	0.05	0.348	0.03	0.695	0.06	0.118	0.17
043	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
044	0.346	0.11	0.279	0.02	1.251	0.19	0.354	0.10	0.842	0.34	0.349	0.02	0.698	0.05	0.067	0.07
045	0.614	0.03	0.307	0.01	1.459	0.22	0.360	0.00	0.842	0.12	0.384	0.02	0.767	0.03	0.160	0.07
080	1.011	0.61	0.276	0.20	1.457	0.10	0.282	0.00	1.181	0.10	0.455	0.03	0.911	0.06	0.211	0.11
081	1.771	0.38	0.358	0.19	1.554	0.21	0.500	0.24	1.978	0.27	0.353	0.05	1.413	0.19	0.035	0.00
082	1.189	0.04	0.426	0.18	2.631	0.08	0.680	0.09	1.442	0.12	0.425	0.01	1.698	0.06	0.042	0.00
083	1.014	0.21	0.277	0.19	2.217	1.17	0.453	0.25	1.382	0.22	0.460	0.01	1.841	0.05	0.295	0.05
r.Mean	0.605	0.13	0.310	0.13	1.533	0.19	0.453	0.11	0.970	0.17	0.377	0.03	0.889	0.15	0.133	0.07
Std.Dev.	0.261	0.13	0.242	0.21	0.650	0.23	0.341	0.16	0.277	0.17	0.042	0.02	0.329	0.31	0.071	0.06

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 11-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Page

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.014	0.00	3.415	0.31	10.275	2.29	0.137	0.01	21.609	8.96	0.068	0.01	0.87	2.40
002	0.015	0.00	3.710	0.49	9.642	12.35	0.148	0.02	20.973	8.67	0.074	0.01	1.59	3.85
003	0.019	0.00	4.738	0.15	8.934	8.24	0.190	0.01	34.200	12.45	0.095	0.00	1.52	3.83
004	0.014	0.00	3.617	0.27	6.752	6.00	0.289	0.02	18.755	1.51	0.072	0.01	0.64	1.59
005	0.018	0.00	4.567	0.40	8.497	7.46	0.183	0.02	21.919	1.92	0.091	0.01	0.73	2.00
006	0.017	0.00	4.361	0.28	13.055	0.91	0.264	0.19	21.665	7.33	0.087	0.01	0.73	1.92
007	0.015	0.00	3.636	0.30	3.636	0.30	0.145	0.01	21.180	6.08	0.073	0.01	0.50	1.61
008	0.016	0.00	3.886	0.32	3.886	0.32	0.236	0.17	20.209	1.65	0.078	0.01	0.24	0.42
009	0.013	0.00	3.153	0.08	5.956	5.52	0.126	0.00	21.411	4.50	0.063	0.00	0.75	1.82
010	0.014	0.00	3.386	0.50	6.209	5.15	0.135	0.02	16.455	7.82	0.068	0.01	0.99	2.39
011	0.047	0.03	3.938	0.38	10.125	12.75	0.563	0.52	73.350	21.30	0.079	0.01	2.62	6.33
012	0.332	0.43	3.398	0.43	15.877	11.52	1.053	0.95	55.259	13.79	0.068	0.01	1.96	4.56
013	0.016	0.00	3.949	0.10	7.457	6.91	0.158	0.00	48.639	49.28	0.079	0.00	4.19	13.10
014	0.016	0.00	3.886	0.50	7.159	6.05	0.155	0.02	22.491	1.35	0.078	0.01	0.61	1.60
015	0.015	0.00	3.858	0.17	3.858	0.17	0.154	0.01	24.073	14.95	0.077	0.00	1.13	3.98
016	0.016	0.00	3.919	0.17	3.919	0.17	0.157	0.01	25.783	6.72	0.078	0.00	0.69	1.75
017	0.040	0.05	3.881	0.33	3.881	0.33	0.155	0.01	19.370	0.10	0.078	0.01	0.11	0.10
018	0.015	0.00	3.852	0.43	3.852	0.43	0.154	0.02	24.482	3.40	0.077	0.01	0.37	0.88
019	0.016	0.00	3.989	0.02	3.989	0.02	0.160	0.00	34.309	4.98	0.080	0.00	0.38	1.32
020	0.018	0.00	4.440	0.31	4.440	0.31	0.453	0.56	29.395	7.40	0.089	0.01	0.66	1.95
021	0.039	0.02	3.364	0.82	6.023	4.50	0.387	0.17	17.327	1.56	0.067	0.02	0.62	1.20
022	0.012	0.00	3.102	0.30	3.102	0.30	0.124	0.01	16.723	0.35	0.062	0.01	0.10	0.12
023	0.074	0.01	4.119	0.17	19.773	0.82	0.249	0.18	188.136	43.27	0.082	0.00	3.35	11.50
024	0.036	0.04	3.517	0.19	6.595	5.96	0.141	0.01	28.291	12.80	0.070	0.00	1.43	3.63
025	0.012	0.00	3.040	0.06	7.557	8.98	0.122	0.00	21.875	2.02	0.061	0.00	0.90	2.39
026	0.014	0.00	3.617	0.13	6.930	6.76	0.145	0.01	33.273	1.20	0.072	0.00	0.64	1.79
027	0.039	0.04	4.028	0.48	4.028	0.48	0.161	0.02	13.648	0.03	0.081	0.01	0.12	0.16
028	0.143	0.26	3.307	0.45	16.650	13.51	1.734	3.18	21.598	3.61	0.066	0.01	1.79	3.58
030	0.318	999.99	3.977	999.99	19.091	999.99	1.273	999.99	60.455	999.99	0.080	999.99	999.99	999.99
031	0.015	0.00	3.818	0.05	3.818	0.05	0.382	0.16	14.523	4.75	0.076	0.00	0.39	1.26
032	0.016	0.00	3.926	0.28	8.401	9.23	0.157	0.01	36.764	5.18	0.079	0.01	1.10	2.71
033	0.028	0.03	3.500	0.09	3.500	0.09	0.140	0.00	21.691	0.84	0.070	0.00	0.11	0.21
034	0.015	0.00	3.676	0.37	7.514	7.30	0.147	0.01	24.375	6.89	0.074	0.01	1.13	2.53
035	0.018	0.00	4.409	0.00	4.409	0.00	0.176	0.00	24.691	0.00	0.088	0.00	0.05	0.10
036	0.013	0.00	3.278	0.31	3.278	0.31	0.131	0.01	17.109	4.22	0.066	0.01	0.38	1.11
037	0.014	0.00	3.528	0.28	3.528	0.28	0.141	0.01	23.373	6.11	0.071	0.01	0.54	1.61
038	0.014	999.99	3.602	999.99	3.602	999.99	0.144	999.99	12.968	999.99	0.072	999.99	999.99	999.99
039	0.014	0.00	3.438	0.19	3.438	0.19	0.138	0.01	13.005	3.39	0.069	0.00	0.31	0.89
040	0.013	0.00	3.318	0.18	7.068	7.68	0.262	0.25	21.382	11.78	0.066	0.00	1.47	3.59
041	0.014	0.00	3.511	0.02	7.361	7.68	0.140	0.00	16.845	5.51	0.070	0.00	0.98	2.42
042	0.014	0.00	3.477	0.30	6.474	5.70	0.139	0.01	13.125	3.05	0.070	0.01	0.70	1.64
043	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
044	0.014	0.00	3.489	0.25	3.489	0.25	0.140	0.01	31.423	3.65	0.070	0.00	0.36	0.95
045	0.038	0.04	3.835	0.17	3.835	0.17	0.453	0.59	27.750	13.50	0.077	0.00	1.07	3.58
080	0.018	0.00	4.554	0.30	8.517	7.62	0.182	0.01	17.216	4.32	0.091	0.01	0.96	2.22
081	0.014	0.00	3.532	0.48	6.929	7.28	0.141	0.02	33.077	21.41	0.071	0.01	2.20	5.85
082	0.017	0.00	4.246	0.15	11.889	0.41	0.170	0.01	44.187	4.91	0.085	0.00	0.43	1.29
083	0.018	0.00	4.603	0.13	8.805	8.54	0.184	0.01	32.366	21.18	0.092	0.00	2.29	5.88
Ar.Mean	0.036	0.02	3.774	0.27	7.170	4.25	0.271	0.16	29.845	8.22	0.075	0.01	0.99	2.66
Std.dev.	0.065	0.07	0.418	0.17	4.136	4.21	0.311	0.50	26.706	10.04	0.008	0.00	0.87	2.61

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 11-91

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001	SCREEN MISSING		
002			
003			
004	SCREEN MISSING		
005			
006			
007			
008			
009			
010			
011	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
012			
013			
014			
015			
016			
017			
018			
019			
020			
021	SCREEN MISSING		
022			
023	LIQUID CLOUDY	LIQUID CLOUDY	
024			
025			
026			
027			
028		BIRD DROPPINGS ON SCREEN	
030	VOID/POSSIBLE CONTAMINATION	BIRD DROPPINGS ON SCREEN	MISSING SAMPLE A
031			
032			
033			
034			
035			
036			
037			
038		VOID/VANDALISM	MISSING SAMPLE B
039			
040			
041			
042			
043	VOID/POSSIBLE CONTAMINATION	VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE A and B
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 12-91

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days) and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.316	0.37	0.128	0.00	0.316	0.37	0.064	0.00	0.384	0.01	0.640	0.02	1.280	0.05	0.141	0.02
002	0.253	0.00	0.127	0.00	0.190	0.13	0.063	0.00	0.380	0.00	0.634	0.00	1.267	0.00	0.108	0.09
003	0.464	0.00	0.116	0.00	0.928	0.01	0.209	0.04	0.348	0.00	0.580	0.01	1.160	0.01	0.151	0.02
004	0.176	0.11	0.118	0.00	0.351	0.22	0.059	0.00	0.757	0.79	0.589	0.02	1.178	0.05	0.164	0.04
005	0.111	0.00	0.111	0.00	0.223	0.00	0.156	0.05	0.334	0.00	0.557	0.00	1.115	0.01	0.106	0.10
006	0.313	0.38	0.125	0.00	0.376	0.25	0.144	0.16	0.376	0.00	0.626	0.00	1.252	0.01	0.150	0.00
007	0.143	0.00	0.143	0.00	0.286	0.01	0.072	0.00	0.429	0.01	0.716	0.02	1.432	0.05	0.107	0.07
008	0.229	0.14	0.154	0.01	0.308	0.02	0.077	0.00	0.462	0.03	0.770	0.04	1.539	0.09	0.077	0.00
009	0.229	0.15	0.153	0.00	0.305	0.00	0.076	0.00	0.458	0.00	0.763	0.01	1.526	0.01	0.076	0.00
010	0.215	0.14	0.144	0.00	0.215	0.14	0.072	0.00	0.431	0.00	0.718	0.00	1.435	0.01	0.072	0.00
011	0.443	0.28	0.368	0.43	0.443	0.28	0.164	0.04	0.665	0.42	0.743	0.03	1.486	0.05	0.192	0.08
012	0.209	0.14	0.139	0.00	0.418	0.28	0.070	0.00	0.418	0.00	0.696	0.01	1.393	0.01	0.070	0.03
013	0.360	0.43	0.144	0.00	0.863	0.58	0.173	0.06	0.647	0.43	0.719	0.00	2.158	1.44	0.122	0.10
014	0.535	0.01	0.134	0.00	0.535	0.01	0.100	0.07	0.401	0.01	0.669	0.01	1.338	0.02	0.067	0.00
015	0.222	0.14	0.149	0.01	0.443	0.28	0.074	0.00	0.447	0.02	0.745	0.04	1.490	0.07	0.074	0.00
016	0.768	0.02	0.128	0.00	0.512	0.02	0.256	0.06	0.699	0.62	0.640	0.02	1.280	0.04	0.064	0.00
017	0.203	0.15	0.134	0.01	0.203	0.15	0.067	0.00	0.402	0.03	0.669	0.04	1.339	0.09	0.148	0.04
018	0.141	0.01	0.141	0.01	0.213	0.15	0.070	0.00	0.422	0.02	0.703	0.04	1.405	0.07	0.169	0.01
019	0.213	0.15	0.142	0.00	0.283	0.01	0.071	0.00	0.425	0.01	0.708	0.02	1.415	0.04	0.071	0.00
020	1.227	0.06	0.123	0.01	0.365	0.23	0.061	0.00	1.347	0.18	0.613	0.03	1.227	0.06	0.269	0.04
021	0.210	0.16	0.138	0.01	0.420	0.31	0.069	0.01	0.414	0.04	0.690	0.06	1.379	0.12	0.069	0.01
022	0.136	0.01	0.136	0.01	0.272	0.02	0.068	0.00	0.408	0.03	0.680	0.04	1.360	0.08	0.149	[illegible]
023	0.216	0.13	0.216	0.13	1.015	0.21	0.406	0.09	0.437	0.03	0.729	0.06	1.458	0.11	0.126	[illegible]
024	0.603	0.02	0.900	0.58	2.105	0.55	0.723	0.04	0.452	0.01	0.753	0.02	1.507	0.04	0.075	0.00
025	0.225	0.15	0.150	0.00	1.051	0.29	0.187	0.22	0.675	0.44	0.752	0.01	1.503	0.02	0.180	0.06
026	0.136	0.00	0.136	0.00	0.407	0.26	0.103	0.07	0.409	0.01	0.682	0.02	1.363	0.04	0.068	0.00
027	0.125	0.00	0.125	0.00	0.501	0.01	0.119	0.11	0.565	0.39	0.626	0.01	1.253	0.02	0.119	0.11
028	0.126	0.00	0.191	0.13	0.634	0.28	0.165	0.08	0.379	0.01	0.632	0.02	1.264	0.05	0.215	0.02
030	0.427	0.28	0.427	0.28	1.567	0.26	0.526	0.36	0.640	0.42	0.712	0.01	1.425	0.02	0.228	0.05
031	0.128	0.01	0.324	0.40	0.517	0.53	0.293	0.46	0.571	0.36	0.639	0.03	1.278	0.06	0.120	0.11
032	0.134	0.01	0.134	0.01	0.204	0.15	0.067	0.00	0.403	0.03	0.671	0.05	1.342	0.09	0.116	0.10
033	0.122	0.01	0.122	0.01	0.861	0.31	0.232	0.01	0.367	0.03	0.612	0.05	1.223	0.09	0.159	0.01
034	0.134	0.00	0.134	0.00	0.202	0.14	0.067	0.00	0.402	0.01	0.669	0.02	1.339	0.04	0.067	0.08
035	0.150	0.01	0.150	0.01	0.226	0.16	0.075	0.00	0.449	0.02	0.748	0.03	1.497	0.06	0.075	0.00
036	0.141	0.01	0.141	0.01	0.210	0.13	0.071	0.00	0.424	0.03	0.707	0.04	1.414	0.09	0.071	0.00
037	0.149	0.01	0.149	0.01	0.149	0.01	0.075	0.01	0.448	0.04	0.746	0.06	1.492	0.13	0.113	0.08
038	0.128	0.00	0.128	0.00	0.255	0.00	0.095	0.06	0.382	0.01	0.638	0.01	1.275	0.02	0.109	0.09
039	0.124	0.00	0.124	0.00	0.248	0.01	0.062	0.00	0.371	0.01	0.619	0.01	1.223	999.99	0.186	0.03
040	0.149	0.00	0.149	0.00	0.595	0.00	0.253	0.09	0.446	0.00	0.744	0.01	1.488	0.01	0.074	0.00
041	0.133	0.00	0.133	0.00	0.266	0.00	0.067	0.00	0.400	0.00	0.666	0.00	1.332	0.01	0.113	0.09
042	0.119	0.00	0.119	0.00	0.238	0.00	0.059	0.00	0.653	0.59	0.595	0.00	1.190	0.01	0.143	0.06
043	0.387	0.27	0.324	0.40	0.380	0.24	0.108	0.08	0.570	0.35	0.639	0.03	1.278	0.06	0.153	0.04
044	0.149	0.00	0.149	0.00	0.447	0.29	0.185	0.22	0.448	0.01	0.747	0.02	1.495	0.04	0.075	0.00
045	0.132	0.00	0.197	0.13	0.528	0.01	0.164	0.19	0.396	0.01	0.660	0.02	1.321	0.03	0.158	0.09
080	0.983	0.06	0.123	0.01	0.737	0.05	0.194	0.13	1.475	0.10	0.614	0.04	1.229	0.08	0.221	0.01
081	2.081	0.16	0.123	0.01	0.980	0.04	0.257	0.01	2.451	0.10	0.613	0.03	2.451	0.10	0.283	0.09
082	0.761	0.01	0.127	0.00	0.890	0.27	0.331	0.21	1.143	0.28	0.635	0.01	1.269	0.02	0.063	0.00
083	0.619	0.26	0.124	0.00	0.494	0.01	0.062	0.00	0.989	0.02	0.618	0.01	1.236	0.03	0.210	0.03
Ar.Mean	0.327	0.09	0.173	0.06	0.504	0.16	0.150	0.06	0.571	0.12	0.674	0.02	1.387	0.08	0.128	[illegible]
Std.Dev.	0.354	0.12	0.126	0.13	0.377	0.16	0.131	0.10	0.370	0.20	0.056	0.02	0.224	0.21	0.057	0.04

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AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days) and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.026	0.00	6.398	0.23	6.398	0.23	0.256	0.01	6.398	0.23	0.128	0.00	0.11	0.14
002	0.025	0.00	6.336	0.02	6.336	0.02	0.253	0.00	6.336	0.02	0.127	0.00	0.02	0.04
003	0.023	0.00	5.798	0.06	5.798	0.06	0.232	0.00	18.542	4.45	0.116	0.00	0.33	1.19
004	0.024	0.00	5.892	0.25	5.892	0.25	0.236	0.01	10.102	8.67	0.118	0.00	0.74	2.29
005	0.033	0.02	5.575	0.04	5.575	0.04	0.223	0.00	18.966	6.84	0.111	0.00	0.51	1.82
006	0.025	0.00	6.260	0.03	6.260	0.03	0.250	0.00	20.019	9.92	0.125	0.00	0.77	2.64
007	0.029	0.00	7.158	0.23	7.158	0.23	0.286	0.01	7.158	0.23	0.143	0.00	0.06	0.09
008	0.031	0.00	7.696	0.43	7.696	0.43	0.308	0.02	7.696	0.43	0.154	0.01	0.12	0.17
009	0.031	0.00	7.628	0.05	7.628	0.05	0.305	0.00	11.429	7.55	0.153	0.00	0.56	2.01
010	0.029	0.00	7.176	0.03	7.176	0.03	0.287	0.00	7.176	0.03	0.144	0.00	0.03	0.05
011	0.208	0.05	7.432	0.27	7.432	0.27	1.178	1.15	15.757	16.92	0.149	0.01	1.45	4.46
012	0.028	0.00	6.963	0.05	6.963	0.05	0.279	0.00	6.963	0.05	0.139	0.00	0.04	0.08
013	0.043	0.03	7.193	0.00	7.193	0.00	0.288	0.00	7.193	0.00	0.144	0.00	0.22	0.40
014	0.027	0.00	6.688	0.09	6.688	0.09	0.268	0.00	12.664	11.86	0.134	0.00	0.87	3.16
015	0.030	0.00	7.449	0.38	7.449	0.38	0.298	0.01	11.267	8.01	0.149	0.01	0.67	2.12
016	0.026	0.00	6.397	0.19	6.397	0.19	0.256	0.01	19.251	8.26	0.128	0.00	0.67	2.19
017	0.027	0.00	6.693	0.44	6.693	0.44	0.268	0.02	6.693	0.44	0.134	0.01	0.13	0.17
018	0.028	0.00	7.027	0.36	7.027	0.36	0.281	0.01	7.027	0.36	0.141	0.01	0.10	0.15
019	0.028	0.00	7.076	0.20	7.076	0.20	0.283	0.01	12.098	10.24	0.142	0.00	0.78	2.72
020	0.025	0.00	6.135	0.30	6.135	0.30	0.245	0.01	6.135	0.30	0.123	0.01	0.11	0.12
021	0.028	0.00	6.897	0.62	6.897	0.62	0.276	0.02	6.897	0.62	0.138	0.01	0.19	0.25
022	0.027	0.00	6.799	0.42	6.799	0.42	0.272	0.02	6.799	0.42	0.136	0.01	0.11	0.17
023	0.029	0.00	7.288	0.55	7.288	0.55	0.292	0.02	34.872	3.17	0.146	0.01	0.37	0.83
024	0.209	0.24	7.534	0.20	18.682	22.09	1.193	1.78	42.109	10.91	0.151	0.00	2.61	6.30
025	0.030	0.00	7.517	0.10	7.517	0.10	0.301	0.00	14.236	13.34	0.150	0.00	1.05	3.54
026	0.027	0.00	6.815	0.20	6.815	0.20	0.273	0.01	11.654	9.87	0.136	0.00	0.76	2.62
027	0.025	0.00	6.262	0.10	6.262	0.10	0.251	0.00	15.578	18.52	0.125	0.00	1.39	4.93
028	0.025	0.00	6.318	0.24	6.318	0.24	0.253	0.01	14.690	16.99	0.126	0.00	1.29	4.52
030	0.128	0.03	7.125	0.10	13.582	13.01	0.857	0.58	38.309	47.92	0.143	0.00	4.52	12.95
031	0.039	0.03	6.391	0.28	6.391	0.28	0.256	0.01	26.638	40.78	0.128	0.01	3.10	10.85
032	0.027	0.00	6.711	0.45	6.711	0.45	0.268	0.02	6.711	0.45	0.134	0.01	0.13	0.18
033	0.024	0.00	6.117	0.45	6.117	0.45	0.245	0.02	24.741	16.49	0.122	0.01	1.28	4.38
034	0.027	0.00	6.693	0.18	6.693	0.18	0.268	0.01	19.580	25.95	0.134	0.00	1.90	6.92
035	0.030	0.00	7.484	0.29	7.484	0.29	0.299	0.01	7.484	0.29	0.150	0.01	0.08	0.12
036	0.028	0.00	7.068	0.44	7.068	0.44	0.283	0.02	7.068	0.44	0.141	0.01	0.12	0.18
037	0.030	0.00	7.459	0.64	7.459	0.64	0.298	0.03	7.459	0.64	0.149	0.01	0.16	0.26
038	0.026	0.00	6.375	0.12	6.375	0.12	0.255	0.00	10.797	8.73	0.128	0.00	0.66	2.32
039	0.025	0.00	6.188	0.14	6.188	0.14	0.248	0.01	6.188	0.14	0.124	0.00	0.04	0.06
040	0.030	0.00	7.440	0.05	7.440	0.05	0.298	0.00	22.326	3.13	0.149	0.00	0.24	0.83
041	0.027	0.00	6.660	0.05	6.660	0.05	0.266	0.00	14.014	14.76	0.133	0.00	1.07	3.94
042	0.024	0.00	5.950	0.04	5.950	0.04	0.238	0.00	5.950	0.04	0.119	0.00	0.05	0.16
043	0.026	0.00	6.389	0.32	12.283	12.10	1.035	1.07	6.389	0.32	0.128	0.01	1.09	3.18
044	0.030	0.00	7.474	0.19	7.474	0.19	0.299	0.01	18.545	21.95	0.149	0.00	1.64	5.85
045	0.026	0.00	6.603	0.16	6.603	0.16	0.264	0.01	11.168	8.97	0.132	0.00	0.69	2.38
080	0.025	0.00	6.144	0.40	6.144	0.40	0.246	0.02	10.304	7.92	0.123	0.01	0.66	2.09
081	0.025	0.00	6.128	0.26	6.128	0.26	0.245	0.01	6.128	0.26	0.123	0.01	0.09	0.10
082	0.025	0.00	6.345	0.12	6.345	0.12	0.382	0.26	20.328	5.46	0.127	0.00	0.48	1.44
083	0.025	0.00	6.180	0.13	6.180	0.13	0.247	0.01	6.180	0.13	0.124	0.00	0.05	0.08
Ar.Mean	0.037	0.01	6.736	0.23	7.225	1.20	0.337	0.11	13.375	7.78	0.135	0.00	0.71	2.24
Std.dev.	0.039	0.03	0.560	0.17	2.176	3.96	0.227	0.34	8.662	10.27	0.011	0.00	0.88	2.78

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DEPOSITION DATA
Comments and Messages Only

Page

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
012			
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039		SO4 VOID/LAB EQUIPMENT FAILURE	
040			
041			
042			
043	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
044			
045			
080			
081			
082			
083			

APPENDIX D

INDIGENOUS VEGETATION DATA

Appendix D
Indigenous Vegetation Data

Indigenous vegetation data were collected during the first and fourth quarters of 1991 at eight sites: 1, 2, 3, 4, 6, 40, 42, and 44. Leaf phytomass was analyzed for nine ions in the laboratory. No rinsate, leaf area, or leaf biomass data were reported in 1990. No data were reported as missing during the 1991 data collection.

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001
Plant ID.	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
Laboratory Number	96	97	98	99	100	101	102	103	104	105
Cations (ppm)										
Sodium	550.00	500.00	600.00	500.00	500.00	500.00	500.00	450.00	500.00	350.00
Potassium	15000.00	12000.00	9500.00	13000.00	15000.00	10500.00	13000.00	11000.00	11500.00	10500.00
Calcium	18575.00	23138.00	19750.00	19338.00	16613.00	19400.00	16938.00	18488.00	17475.00	19525.00
Magnesium	1588.00	1675.00	1138.00	1188.00	1375.00	1475.00	1488.00	1563.00	1625.00	1513.00
Anions (ppm)										
Chloride	5200.00	7600.00	6000.00	6400.00	7200.00	6200.00	5200.00	5200.00	4800.00	5200.00
Sulfate	0.00	0.00	0.00	1154.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	99.00	35.00	78.00	81.00	86.00	83.00	96.00	99.00	85.00	73.00
Phosphate	1250.00	1544.00	1397.00	1323.00	1397.00	1029.00	1176.00	1470.00	1029.00	1176.00
Fluoride	27.00	29.00	30.00	28.00	28.00	25.00	26.00	24.00	22.00	22.00

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Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0002	0002	0002	0002	0002	0002	0002	0002	0002	0002
Plant ID.	02-01	02-02	02-03	02-04	02-05	02-06	02-07	02-08	02-09	02-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
Laboratory Number	107	108	109	110	111	112	113	114	115	116
Cations (ppm)										
Sodium	57895.00	61842.00	63158.00	68421.00	63158.00	47368.00	56579.00	53947.00	57895.00	48611.00
Potassium	22500.00	24500.00	24000.00	16500.00	19000.00	34762.00	23000.00	27000.00	22000.00	21579.00
Calcium	14088.00	14963.00	9138.00	9413.00	12088.00	18263.00	17800.00	14550.00	10138.00	12950.00
Magnesium	5500.00	6250.00	3887.00	4213.00	6250.00	6375.00	6500.00	5375.00	4100.00	5625.00
Anions (ppm)										
Chloride	41600.00	53000.00	46600.00	54400.00	48000.00	40800.00	60200.00	46400.00	49600.00	52200.00
Sulfate	417.00	4840.00	4071.00	6699.00	0.00	5224.00	1667.00	0.00	0.00	2170.00
Nitrate	134.00	183.00	68.00	83.00	76.00	73.00	100.00	38.00	48.00	69.00
Phosphate	1911.00	1838.00	1985.00	1911.00	1691.00	1764.00	1544.00	1691.00	2205.00	2279.00
Fluoride	17.00	16.00	15.00	14.00	14.00	14.00	13.00	13.00	12.00	13.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0003	0003	0003	0003	0003	0003	0003	0003	0003	0003
Plant ID.	03-01	03-02	03-03	03-04	03-05	03-06	03-07	03-08	03-09	03-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032
Laboratory Number	118	119	120	121	122	123	124	125	126	127
Cations (ppm)										
Sodium	63158.00	61842.00	67105.00	67105.00	61842.00	72368.00	73684.00	57895.00	59211.00	63158.00
Potassium	20000.00	26316.00	29474.00	32000.00	23684.00	16500.00	17000.00	32500.00	33000.00	28421.00
Calcium	24925.00	9275.00	11875.00	11263.00	8963.00	8763.00	7113.00	17300.00	9025.00	14175.00
Magnesium	8375.00	3663.00	5125.00	4500.00	6250.00	5875.00	3913.00	6250.00	6375.00	5375.00
Anions (ppm)										
Chloride	36800.00	58200.00	67800.00	68400.00	59600.00	59600.00	68600.00	46600.00	45200.00	53600.00
Sulfate	417.00	1488.00	4840.00	4038.00	417.00	2560.00	5256.00	0.00	0.00	357.00
Nitrate	120.00	244.00	130.00	168.00	94.00	183.00	145.00	76.00	105.00	125.00
Phosphate	1103.00	1544.00	1250.00	1617.00	1544.00	1397.00	1838.00	1250.00	1838.00	1323.00
Fluoride	14.00	12.00	12.00	11.00	11.00	11.00	11.00	11.00	11.00	10.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0004	0004	0004	0004	0004	0004	0004	0004	0004	0004
Plant ID.	04-01	04-02	04-03	04-04	04-05	04-06	04-07	04-08	04-09	04-10
Plot Number	1	1	2	3	3	4	4	5	6	7
Transect	L	L	L	L	L	L	L	L	U	U
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043
Laboratory Number	129	130	131	132	133	134	135	136	137	138
Cations (ppm)										
Sodium	381.00	429.00	381.00	381.00	333.00	476.00	476.00	350.00	700.00	250.00
Potassium	19000.00	16000.00	12000.00	11000.00	15500.00	13000.00	15000.00	16000.00	15000.00	14000.00
Calcium	18500.00	15488.00	13188.00	11213.00	14225.00	13538.00	15988.00	15725.00	15650.00	16675.00
Magnesium	1300.00	1538.00	1100.00	1425.00	1175.00	1513.00	1250.00	1288.00	1200.00	1488.00
Anions (ppm)										
Chloride	8800.00	6800.00	5800.00	4600.00	5800.00	6000.00	6600.00	8600.00	11200.00	8400.00
Sulfate	0.00	385.00	3077.00	385.00	4615.00	0.00	0.00	2692.00	0.00	0.00
Nitrate	88.00	88.00	90.00	39.00	126.00	23.00	146.00	65.00	58.00	51.00
Phosphate	1397.00	1544.00	1397.00	1323.00	1470.00	1250.00	1250.00	1691.00	1544.00	1544.00
Fluoride	14.00	19.00	20.00	18.00	18.00	15.00	17.00	14.00	15.00	17.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0006	0006	0006	0006	0006	0006	0006	0006	0006	0006
Plant ID.	06-01	06-02	06-03	06-04	06-05	06-06	06-07	06-08	06-09	06-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054
Laboratory Number	140	141	142	143	144	145	146	147	148	149
Cations (ppm)										
Sodium	250.00	300.00	250.00	250.00	250.00	250.00	250.00	500.00	250.00	200.00
Potassium	9500.00	12500.00	13000.00	15000.00	15500.00	14000.00	17000.00	15500.00	13000.00	13500.00
Calcium	23125.00	17825.00	19163.00	19338.00	18438.00	17075.00	16525.00	20850.00	17313.00	21412.00
Magnesium	1775.00	1813.00	2213.00	1238.00	1625.00	1538.00	1350.00	1513.00	1388.00	1763.00
Anions (ppm)										
Chloride	8600.00	8000.00	8200.00	7800.00	8000.00	9000.00	7400.00	7600.00	8200.00	6000.00
Sulfate	2340.00	3846.00	769.00	0.00	0.00	4263.00	0.00	0.00	3494.00	385.00
Nitrate	44.00	58.00	51.00	59.00	63.00	48.00	58.00	54.00	69.00	54.00
Phosphate	1544.00	1323.00	1544.00	1838.00	1911.00	1838.00	1764.00	1838.00	1911.00	1911.00
Fluoride	18.00	18.00	17.00	19.00	19.00	18.00	18.00	18.00	18.00	19.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0040	0040	0040	0040	0040	0040	0040	0040	0040	0040
Plant ID.	40-01	40-02	40-03	40-04	40-05	40-06	40-07	40-08	40-09	40-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065
Laboratory Number	151	152	153	154	155	156	157	158	159	160
Cations (ppm)										
Sodium	300.00	300.00	250.00	500.00	250.00	350.00	300.00	250.00	300.00	250.00
Potassium	11500.00	11500.00	12000.00	13000.00	11500.00	14737.00	14737.00	14211.00	16316.00	13158.00
Calcium	14775.00	16600.00	14938.00	15975.00	14125.00	12538.00	15338.00	15450.00	14875.00	13288.00
Magnesium	1050.00	1675.00	1363.00	1875.00	1275.00	1188.00	1875.00	1113.00	1238.00	1463.00
Anions (ppm)										
Chloride	4800.00	4800.00	4600.00	5800.00	3800.00	4400.00	4200.00	4000.00	5400.00	4400.00
Sulfate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	58.00	49.00	51.00	54.00	54.00	24.00	18.00	25.00	23.00	13.00
Phosphate	1985.00	1985.00	2279.00	1764.00	1838.00	1544.00	1911.00	1544.00	1176.00	1470.00
Fluoride	17.00	17.00	18.00	17.00	18.00	20.00	21.00	23.00	23.00	22.00

A R I Z O N A P U B L I C S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0042	0042	0042	0042	0042	0042	0042	0042	0042	0042
Plant ID.	42-01	42-02	42-03	42-04	42-05	42-06	42-07	42-08	42-09	42-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076
Laboratory Number	162	163	164	165	166	167	168	169	170	171
Cations (ppm)										
Sodium	350.00	300.00	250.00	250.00	300.00	350.00	350.00	500.00	350.00	350.00
Potassium	12632.00	11579.00	10000.00	9000.00	9500.00	13158.00	13684.00	9500.00	15263.00	14211.00
Calcium	17763.00	19100.00	20675.00	19800.00	21575.00	22850.00	15650.00	17638.00	17438.00	16175.00
Magnesium	1988.00	1425.00	1675.00	1388.00	1588.00	1525.00	1475.00	1713.00	1213.00	1225.00
Anions (ppm)										
Chloride	8000.00	6400.00	6200.00	6200.00	7800.00	10000.00	7000.00	6600.00	7000.00	5800.00
Sulfate	2857.00	0.00	0.00	0.00	4345.00	4345.00	1786.00	2143.00	0.00	0.00
Nitrate	49.00	29.00	18.00	26.00	23.00	20.00	23.00	18.00	24.00	23.00
Phosphate	1470.00	1397.00	882.00	1250.00	1323.00	1397.00	1323.00	1323.00	1544.00	1470.00
Fluoride	21.00	21.00	22.00	22.00	22.00	22.00	20.00	20.00	19.00	18.00

A R I Z O N A P U B L I C S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0044	0044	0044	0044	0044	0044	0044	0044	0044	0044
Plant ID.	44-01	44-02	44-03	44-04	44-05	44-06	44-07	44-08	44-09	44-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	S	S	S	S	S	S	N	N	N	N
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087
Laboratory Number	173	174	175	176	177	178	179	180	181	182
Cations (ppm)										
Sodium	43421.00	34211.00	43421.00	37500.00	35000.00	41250.00	30000.00	37500.00	45000.00	33750.00
Potassium	22857.00	16316.00	18947.00	12000.00	25500.00	20000.00	29000.00	25500.00	20500.00	32500.00
Calcium	10750.00	12950.00	8513.00	6875.00	9313.00	9350.00	12388.00	12775.00	9050.00	13500.00
Magnesium	6625.00	6875.00	6000.00	5500.00	4375.00	4375.00	6250.00	6375.00	7625.00	8125.00
Anions (ppm)										
Chloride	41000.00	36000.00	31520.00	33600.00	35600.00	35200.00	29200.00	32400.00	32000.00	27200.00
Sulfate	5893.00	3214.00	3869.00	6071.00	4286.00	8312.00	2500.00	6786.00	5571.00	10227.00
Nitrate	60.00	50.00	46.00	136.00	71.00	76.00	70.00	56.00	48.00	43.00
Phosphate	1691.00	1691.00	1176.00	1323.00	1103.00	1617.00	1397.00	1470.00	1544.00	1176.00
Fluoride	14.00	13.00	14.00	13.00	12.00	12.00	12.00	12.00	11.00	11.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001
Plant ID.	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
Laboratory Number	881	882	883	884	885	886	887	888	889	890
Cations (ppm)										
Sodium	409.00	227.00	318.00	318.00	227.00	364.00	227.00	227.00	227.00	182.00
Potassium	11905.00	10476.00	10000.00	13810.00	13810.00	10476.00	14286.00	13333.00	13333.00	10952.00
Calcium	16163.00	21538.00	19788.00	17000.00	12563.00	18213.00	17975.00	18600.00	13438.00	18588.00
Magnesium	1213.00	1463.00	1050.00	1250.00	1163.00	1488.00	1813.00	1688.00	1525.00	1563.00
Anions (ppm)										
Chloride	6800.00	7600.00	7800.00	8200.00	6800.00	7200.00	8400.00	8400.00	6800.00	7000.00
Sulfate	0.00	1250.00	3170.00	4464.00	313.00	714.00	1786.00	7329.00	0.00	5543.00
Nitrate	110.00	134.00	154.00	178.00	171.00	103.00	280.00	83.00	149.00	173.00
Phosphate	1027.00	869.00	869.00	948.00	1027.00	790.00	711.00	711.00	553.00	790.00
Fluoride	30.00	22.00	40.00	41.00	41.00	40.00	41.00	38.00	39.00	40.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0002	0002	0002	0002	0002	0002	0002	0002	0002	0002
Plant ID.	02-01	02-02	02-03	02-04	02-05	02-06	02-07	02-08	02-09	02-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121
Laboratory Number	892	893	894	895	896	897	898	899	900	901
Cations (ppm)										
Sodium	69524.00	51818.00	70476.00	66667.00	49091.00	61905.00	53636.00	53636.00	50000.00	41818.00
Potassium	15238.00	24783.00	19524.00	13810.00	21304.00	26957.00	18571.00	19048.00	18571.00	11000.00
Calcium	10975.00	8213.00	9450.00	9413.00	7875.00	11475.00	10613.00	10488.00	8400.00	10450.00
Magnesium	6075.00	4375.00	4038.00	4213.00	4350.00	5975.00	5825.00	5138.00	3525.00	4663.00
Anions (ppm)										
Chloride	65200.00	53200.00	54800.00	57600.00	50600.00	56000.00	53800.00	41600.00	53600.00	33600.00
Sulfate	5714.00	5476.00	8351.00	8370.00	16753.00	7500.00	7310.00	3259.00	11780.00	4643.00
Nitrate	306.00	234.00	350.00	216.00	156.00	308.00	84.00	91.00	124.00	64.00
Phosphate	948.00	553.00	711.00	1027.00	395.00	1106.00	711.00	553.00	553.00	1027.00
Fluoride	26.00	22.00	21.00	20.00	19.00	18.00	17.00	17.00	16.00	15.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0003	0003	0003	0003	0003	0003	0003	0003	0003	0003
Plant ID.	03-01	03-02	03-03	03-04	03-05	03-06	03-07	03-08	03-09	03-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132
Laboratory Number	903	904	905	906	907	908	909	910	911	912
Cations (ppm)										
Sodium	68571.00	49091.00	66667.00	55455.00	62857.00	67619.00	72381.00	74286.00	65714.00	72381.00
Potassium	22857.00	24286.00	20476.00	25714.00	22857.00	16000.00	22857.00	23810.00	26667.00	20476.00
Calcium	12050.00	8250.00	11450.00	11413.00	11100.00	9588.00	12700.00	11350.00	10663.00	11175.00
Magnesium	5575.00	3600.00	5075.00	4825.00	5300.00	6500.00	4725.00	4663.00	6225.00	5400.00
Anions (ppm)										
Chloride	42600.00	49200.00	53600.00	54800.00	55400.00	54000.00	53200.00	61600.00	48200.00	43600.00
Sulfate	2902.00	3973.00	5045.00	5045.00	1920.00	2857.00	4688.00	3929.00	7143.00	4643.00
Nitrate	143.00	83.00	86.00	114.00	80.00	84.00	193.00	138.00	230.00	283.00
Phosphate	790.00	1185.00	1106.00	869.00	1027.00	1185.00	1106.00	948.00	1185.00	1106.00
Fluoride	16.00	15.00	15.00	15.00	15.00	15.00	14.00	14.00	14.00	14.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0004	0004	0004	0004	0004	0004	0004	0004	0004	0004
Plant ID.	04-01	04-02	04-03	04-04	04-05	04-06	04-07	04-08	04-09	04-10
Plot Number	1	1	2	3	3	4	4	5	6	7
Transect	L	L	L	L	L	L	L	L	U	U
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143
Laboratory Number	914	915	916	917	918	919	920	921	922	923
Cations (ppm)										
Sodium	304.00	304.00	391.00	261.00	348.00	435.00	478.00	400.00	650.00	250.00
Potassium	20000.00	18500.00	19500.00	13500.00	17500.00	17000.00	19000.00	20000.00	19048.00	18571.00
Calcium	19188.00	16725.00	15713.00	15125.00	19763.00	14388.00	18600.00	12963.00	13213.00	8363.00
Magnesium	1375.00	1375.00	1288.00	1575.00	1275.00	1438.00	1388.00	1175.00	1075.00	688.00
Anions (ppm)										
Chloride	8800.00	8400.00	6000.00	5600.00	6800.00	6800.00	7600.00	9160.00	10800.00	9200.00
Sulfate	6071.00	5580.00	10714.00	5313.00	9271.00	4554.00	7024.00	4583.00	0.00	0.00
Nitrate	216.00	178.00	600.00	238.00	204.00	133.00	346.00	136.00	176.00	238.00
Phosphate	1264.00	1106.00	1343.00	1264.00	1343.00	1422.00	1106.00	1343.00	1264.00	1106.00
Fluoride	25.00	29.00	23.00	34.00	33.00	33.00	34.00	23.00	25.00	26.00

A R I Z O N A P U B L I C S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0006	0006	0006	0006	0006	0006	0006	0006	0006	0006
Plant ID.	06-01	06-02	06-03	06-04	06-05	06-06	06-07	06-08	06-09	06-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154
Laboratory Number	925	926	927	928	929	930	931	932	933	934
Cations (ppm)										
Sodium	200.00	300.00	400.00	250.00	300.00	250.00	300.00	300.00	250.00	200.00
Potassium	13333.00	16667.00	14762.00	14286.00	19048.00	17143.00	15238.00	15714.00	15238.00	12857.00
Calcium	22838.00	20213.00	22975.00	13362.00	8250.00	17313.00	18000.00	24388.00	19200.00	19675.00
Magnesium	1838.00	1750.00	2263.00	788.00	688.00	1213.00	1350.00	1625.00	1475.00	1563.00
Anions (ppm)										
Chloride	9400.00	8800.00	9600.00	8400.00	8600.00	9200.00	8000.00	9800.00	9600.00	7400.00
Sulfate	7500.00	5417.00	2917.00	12917.00	3750.00	6250.00	5000.00	6250.00	8333.00	2500.00
Nitrate	95.00	233.00	210.00	320.00	210.00	134.00	85.00	268.00	210.00	154.00
Phosphate	711.00	1264.00	869.00	1027.00	1343.00	1422.00	1501.00	1580.00	1343.00	1185.00
Fluoride	25.00	25.00	25.00	25.00	26.00	25.00	25.00	25.00	24.00	24.00

A R I Z O N A P U B L I C S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0040	0040	0040	0040	0040	0040	0040	0040	0040	0040
Plant ID.	40-01	40-02	40-03	40-04	40-05	40-06	40-07	40-08	40-09	40-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165
Laboratory Number	936	937	938	939	940	941	942	943	944	945
Cations (ppm)										
Sodium	300.00	300.00	200.00	300.00	200.00	350.00	250.00	350.00	350.00	250.00
Potassium	12857.00	11429.00	11905.00	13810.00	10952.00	14000.00	17500.00	11000.00	12000.00	13500.00
Calcium	17100.00	16338.00	19650.00	17350.00	17488.00	13888.00	11925.00	16625.00	16513.00	14250.00
Magnesium	1375.00	1538.00	1475.00	1863.00	1538.00	1300.00	1637.00	1313.00	1175.00	1513.00
Anions (ppm)										
Chloride	5600.00	4200.00	3600.00	5200.00	4000.00	4400.00	4800.00	4600.00	3600.00	8200.00
Sulfate	0.00	0.00	417.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	33.00	44.00	28.00	29.00	33.00	38.00	30.00	23.00	39.00	28.00
Phosphate	1027.00	1422.00	790.00	869.00	948.00	1264.00	1343.00	869.00	948.00	1027.00
Fluoride	23.00	24.00	22.00	23.00	23.00	18.00	19.00	19.00	19.00	19.00

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Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0042	0042	0042	0042	0042	0042	0042	0042	0042	0042
Plant ID.	42-01	42-02	42-03	42-04	42-05	42-06	42-07	42-08	42-09	42-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176
Laboratory Number	947	948	949	950	951	952	953	954	955	956
Cations (ppm)										
Sodium	250.00	300.00	200.00	350.00	150.00	250.00	200.00	400.00	250.00	200.00
Potassium	15000.00	12500.00	10500.00	9130.00	9565.00	13000.00	14000.00	12000.00	16500.00	13000.00
Calcium	15912.00	16425.00	20787.00	22613.00	23875.00	19850.00	18750.00	20413.00	18113.00	15888.00
Magnesium	1813.00	1250.00	1438.00	1363.00	1525.00	1650.00	1550.00	1713.00	1338.00	1213.00
Anions (ppm)										
Chloride	7200.00	6800.00	7200.00	7600.00	7600.00	9400.00	8200.00	8600.00	7000.00	5600.00
Sulfate	0.00	0.00	0.00	2938.00	6060.00	2646.00	5313.00	5747.00	0.00	0.00
Nitrate	178.00	189.00	183.00	64.00	65.00	143.00	125.00	79.00	150.00	88.00
Phosphate	1106.00	869.00	948.00	1185.00	790.00	948.00	1027.00	790.00	1027.00	948.00
Fluoride	20.00	19.00	20.00	20.00	20.00	20.00	19.00	20.00	20.00	20.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0044	0044	0044	0044	0044	0044	0044	0044	0044	0044
Plant ID.	44-01	44-02	44-03	44-04	44-05	44-06	44-07	44-08	44-09	44-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	S	S	S	S	S	S	S	S	S	S
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
NUS Sample ID Number	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187
Laboratory Number	958	959	960	961	962	963	964	965	966	967
Cations (ppm)										
Sodium	31000.00	40000.00	24762.00	21429.00	38571.00	35238.00	29524.00	35714.00	37143.00	32381.00
Potassium	28636.00	25909.00	26364.00	13000.00	23500.00	28500.00	27000.00	19000.00	32000.00	25000.00
Calcium	6563.00	10100.00	8075.00	6388.00	11013.00	11100.00	8988.00	8413.00	10113.00	8763.00
Magnesium	5000.00	6500.00	5025.00	7250.00	6575.00	7050.00	5725.00	6700.00	7925.00	5800.00
Anions (ppm)										
Chloride	36200.00	38800.00	21600.00	23800.00	37200.00	33400.00	29600.00	40400.00	32800.00	35600.00
Sulfate	3563.00	4208.00	2542.00	1667.00	7483.00	5473.00	3030.00	4148.00	4848.00	6875.00
Nitrate	250.00	240.00	268.00	288.00	138.00	154.00	250.00	159.00	314.00	346.00
Phosphate	1027.00	1422.00	790.00	711.00	1264.00	1185.00	1027.00	1659.00	1185.00	948.00
Fluoride	15.00	13.00	12.00	12.00	12.00	11.00	12.00	12.00	11.00	11.00

APPENDIX E

AGRICULTURAL VEGETATION DATA

Appendix E
Agricultural Vegetation Data

Agricultural vegetation data were collected during the second, third, and fourth quarters of 1991. Sites 12, 13, 23, 30, and 43 were sampled during the second and third quarters, and sites 12, 13, and 30 during the fourth. Leaf phytomass was analyzed for nine ions in the laboratory. No rinsate, leaf area, or leaf biomass data were reported in 1991. Cotton boll biomass data were reported during the fourth quarter only. No data were reported as missing during the 1991 data collection.

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	91	91	91	91	91	91	91	91	91	91
Row Number	24	24	102	102	138	138	166	166	254	254
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	38	208	47	166	245	256	75	203	81	249
NUS Sample ID Number	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Laboratory Number	439	440	441	442	443	444	445	446	447	448
Cations (ppm)										
Sodium	2550.00	2800.00	1600.00	1450.00	1250.00	1050.00	1350.00	1400.00	1850.00	1600.00
Potassium	33333.00	34286.00	27619.00	29048.00	27619.00	24286.00	25238.00	24286.00	25238.00	25238.00
Calcium	35250.00	44875.00	38375.00	32625.00	39625.00	40750.00	47750.00	44875.00	42500.00	39750.00
Magnesium	4025.00	4400.00	4138.00	4188.00	3587.00	4213.00	4313.00	4675.00	4525.00	4513.00
Anions (ppm)										
Chloride	20200.00	20400.00	20000.00	22400.00	22800.00	21200.00	20000.00	20800.00	19400.00	17400.00
Sulfate	27619.00	27619.00	24952.00	23714.00	27714.00	26381.00	27619.00	31714.00	31714.00	33048.00
Nitrate	2440.00	2440.00	2040.00	1820.00	2740.00	1790.00	1670.00	1100.00	1490.00	1300.00
Phosphate	2212.00	2528.00	3081.00	3081.00	2449.00	2765.00	2607.00	2844.00	2844.00	3397.00
Fluoride	14.00	13.00	13.00	13.00	13.00	12.00	12.00	12.00	12.00	12.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

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Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	91	91	91	91	91	91	91	91	91	91
Row Number	14	14	53	53	113	113	135	135	137	137
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	128	215	208	253	77	210	60	106	19	72
NUS Sample ID Number	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Laboratory Number	419	450	451	452	453	454	455	456	457	458
Cations (ppm)										
Sodium	2300.00	2900.00	1600.00	2700.00	2200.00	1850.00	2000.00	1950.00	2750.00	2450.00
Potassium	28571.00	27143.00	26667.00	25238.00	30000.00	29048.00	22381.00	23810.00	23810.00	20952.00
Calcium	46000.00	49500.00	42000.00	40000.00	40500.00	39125.00	44625.00	47250.00	37875.00	43875.00
Magnesium	5750.00	5500.00	3900.00	4525.00	4700.00	3088.00	4800.00	4425.00	4388.00	4875.00
Anions (ppm)										
Chloride	22800.00	23200.00	24000.00	25200.00	23800.00	23200.00	22800.00	25200.00	24800.00	25400.00
Sulfate	40333.00	36333.00	34333.00	34333.00	30333.00	24333.00	42333.00	36667.00	40667.00	42667.00
Nitrate	1040.00	880.00	860.00	1410.00	2980.00	1560.00	1190.00	840.00	1000.00	1030.00
Phosphate	2212.00	2054.00	3081.00	2528.00	2607.00	2607.00	2133.00	2844.00	2765.00	2686.00
Fluoride	12.00	12.00	13.00	13.00	12.00	12.00	12.00	12.00	12.00	12.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A P U B L I C S E R V I C E

Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	91	91	91	91	91	91	91	91	91	91
Row Number	46	46	67	67	162	162	182	182	186	186
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	57	196	30	87	50	63	29	286	71	82
NUS Sample ID Number	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Laboratory Number	459	460	461	462	463	464	465	466	467	468
Cations (ppm)										
Sodium	1048.00	789.00	684.00	737.00	737.00	526.00	789.00	1048.00	684.00	632.00
Potassium	24500.00	23500.00	28500.00	30526.00	29000.00	28500.00	29000.00	29000.00	29000.00	29500.00
Calcium	14825.00	17288.00	16100.00	13388.00	14700.00	14900.00	15588.00	15013.00	16688.00	14388.00
Magnesium	2363.00	2363.00	3063.00	2663.00	2725.00	2563.00	2650.00	2688.00	2875.00	2675.00
Anions (ppm)										
Chloride	13600.00	11600.00	12800.00	14000.00	11200.00	10600.00	11200.00	12200.00	10000.00	10400.00
Sulfate	7662.00	8831.00	9136.00	10000.00	10000.00	7825.00	12013.00	8682.00	11558.00	8831.00
Nitrate	65.00	36.00	63.00	66.00	76.00	51.00	74.00	189.00	46.00	50.00
Phosphate	1896.00	2370.00	2449.00	2291.00	2133.00	2528.00	2054.00	2212.00	2133.00	2212.00
Fluoride	12.00	12.00	12.00	12.00	11.00	12.00	12.00	11.00	11.00	11.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	91	91	91	91	91	91	91	91	91	91
Row Number	27	27	102	102	126	126	131	131	173	173
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	62	205	230	245	179	204	83	98	52	121
NUS Sample ID Number	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Laboratory Number	469	470	471	472	473	474	475	476	477	478
Cations (ppm)										
Sodium	3000.00	2300.00	2200.00	2450.00	2350.00	2500.00	2250.00	2100.00	2650.00	2450.00
Potassium	33158.00	29500.00	28500.00	30526.00	29000.00	30000.00	26500.00	27000.00	23500.00	25000.00
Calcium	52500.00	44125.00	46875.00	44500.00	47500.00	46375.00	48375.00	44875.00	44875.00	36625.00
Magnesium	6125.00	5375.00	5750.00	5500.00	5625.00	5500.00	6000.00	5500.00	5375.00	5375.00
Anions (ppm)										
Chloride	20600.00	18800.00	17600.00	18000.00	16800.00	18400.00	18400.00	19200.00	19600.00	21200.00
Sulfate	40455.00	27857.00	35000.00	35000.00	33750.00	32321.00	39205.00	37955.00	36136.00	31071.00
Nitrate	3880.00	2500.00	1740.00	2880.00	1820.00	2800.00	1940.00	1220.00	960.00	1340.00
Phosphate	1817.00	2686.00	2133.00	2686.00	3239.00	2449.00	3081.00	2923.00	2370.00	2844.00
Fluoride	11.00	11.00	11.00	11.00	11.00	10.00	11.00	11.00	11.00	11.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0043	0043	0043	0043	0043	0043	0043	0043	0043	0043
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	91	91	91	91	91	91	91	91	91	91
Row Number	30	30	61	61	63	63	76	76	105	105
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	45	125	115	209	87	210	78	153	113	202
NUS Sample ID Number	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
Laboratory Number	479	480	481	482	483	484	485	486	487	488
Cations (ppm)										
Sodium	1550.00	1500.00	1600.00	1650.00	2050.00	1500.00	750.00	1450.00	1350.00	1150.00
Potassium	20500.00	19500.00	19000.00	21000.00	20500.00	20500.00	19000.00	21000.00	19500.00	20500.00
Calcium	12350.00	12112.00	12900.00	11450.00	11175.00	11050.00	17888.00	12413.00	11088.00	11213.00
Magnesium	2438.00	2263.00	2513.00	2750.00	2413.00	2488.00	2250.00	2463.00	2175.00	2225.00
Anions (ppm)										
Chloride	16800.00	15800.00	15600.00	14800.00	14800.00	16000.00	12400.00	15200.00	14400.00	14000.00
Sulfate	9983.00	9833.00	11938.00	8895.00	10217.00	8895.00	14615.00	9498.00	8025.00	12826.00
Nitrate	29.00	38.00	34.00	20.00	36.00	20.00	83.00	24.00	36.00	31.00
Phosphate	2844.00	2765.00	2528.00	2528.00	2449.00	2765.00	2686.00	2765.00	2212.00	2291.00
Fluoride	10.00	10.00	10.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	91	91	91	91	91	91	91	91	91	91
Row Number	24	24	102	102	138	138	166	166	254	254
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	38	208	47	166	245	256	75	203	81	249
NUS Sample ID Number	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120
Laboratory Number	738	739	740	741	742	743	744	745	746	747
Cations (ppm)										
Sodium	9000.00	6762.00	2762.00	3143.00	1900.00	2238.00	2286.00	2905.00	3190.00	3429.00
Potassium	18095.00	30000.00	20000.00	26500.00	23500.00	20500.00	21000.00	23500.00	23500.00	26500.00
Calcium	39475.00	45100.00	35550.00	45500.00	46425.00	52250.00	64375.00	47525.00	41775.00	42450.00
Magnesium	4438.00	5063.00	4588.00	4688.00	4375.00	4725.00	3600.00	5075.00	4650.00	5063.00
Anions (ppm)										
Chloride	20400.00	19200.00	20800.00	18800.00	21200.00	22000.00	22800.00	19800.00	17600.00	16600.00
Sulfate	55556.00	52778.00	44074.00	45556.00	51481.00	52778.00	61852.00	54259.00	57593.00	57222.00
Nitrate	80.00	260.00	640.00	550.00	240.00	108.00	81.00	300.00	116.00	176.00
Phosphate	2212.00	1896.00	2449.00	2212.00	1896.00	2212.00	2133.00	1896.00	2291.00	1896.00
Fluoride	18.00	18.00	19.00	18.00	20.00	20.00	20.00	20.00	21.00	20.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	91	91	91	91	91	91	91	91	91	91
Row Number	14	14	53	53	113	113	135	135	137	137
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	128	215	208	253	77	210	60	106	19	72
NUS Sample ID Number	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130
Laboratory Number	748	749	750	751	752	753	754	755	756	757
Cations (ppm)										
Sodium	5238.00	5429.00	6000.00	7238.00	4952.00	5619.00	5524.00	7524.00	7143.00	6000.00
Potassium	18571.00	24500.00	22000.00	17143.00	25500.00	23500.00	21000.00	18571.00	24500.00	22500.00
Calcium	46125.00	39275.00	40050.00	42925.00	38275.00	30250.00	39975.00	41075.00	43950.00	41750.00
Magnesium	7250.00	6100.00	4763.00	5575.00	5475.00	4088.00	5550.00	4925.00	5650.00	5200.00
Anions (ppm)										
Chloride	18000.00	19200.00	25600.00	27200.00	22800.00	26400.00	25600.00	26400.00	27200.00	24000.00
Sulfate	54259.00	47963.00	44074.00	51111.00	52963.00	32667.00	54444.00	45556.00	60370.00	54259.00
Nitrate	150.00	290.00	495.00	200.00	850.00	830.00	430.00	495.00	340.00	415.00
Phosphate	1422.00	1817.00	1738.00	1422.00	2133.00	1580.00	1422.00	1185.00	1264.00	1659.00
Fluoride	19.00	20.00	20.00	21.00	19.00	19.00	20.00	19.00	20.00	21.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A P U B L I C S E R V I C E

Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	91	91	91	91	91	91	91	91	91	91
Row Number	46	46	67	67	162	162	182	182	186	186
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	57	196	30	87	50	63	29	286	71	82
NUS Sample ID Number	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140
Laboratory Number	758	759	760	761	762	763	764	765	766	767
Cations (ppm)										
Sodium	650.00	1250.00	500.00	600.00	450.00	800.00	650.00	550.00	550.00	500.00
Potassium	18571.00	23333.00	17143.00	19524.00	17619.00	18571.00	18095.00	19048.00	20000.00	15714.00
Calcium	34500.00	21475.00	32125.00	33525.00	31525.00	30775.00	24525.00	32075.00	24350.00	24713.00
Magnesium	3100.00	2637.00	2637.00	2900.00	2775.00	2875.00	2575.00	2663.00	2513.00	2613.00
Anions (ppm)										
Chloride	9800.00	8400.00	10000.00	10400.00	9600.00	9400.00	10000.00	9200.00	10200.00	11400.00
Sulfate	14183.00	14167.00	14183.00	12583.00	10983.00	12183.00	8583.00	10150.00	9367.00	12967.00
Nitrate	38.00	25.00	76.00	176.00	149.00	131.00	224.00	153.00	243.00	204.00
Phosphate	1343.00	1501.00	1580.00	2133.00	1817.00	1975.00	2844.00	1817.00	1817.00	2212.00
Fluoride	17.00	17.00	17.00	18.00	18.00	18.00	17.00	17.00	16.00	16.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	91	91	91	91	91	91	91	91	91	91
Row Number	27	27	102	102	126	126	131	131	173	173
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	62	205	230	245	179	204	83	98	52	121
NUS Sample ID Number	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150
Laboratory Number	768	769	770	771	772	773	774	775	776	777
Cations (ppm)										
Sodium	1950.00	1700.00	1600.00	2000.00	1750.00	1950.00	1700.00	1750.00	1850.00	2050.00
Potassium	26667.00	29524.00	24286.00	26190.00	24762.00	20952.00	23810.00	25238.00	22857.00	23810.00
Calcium	42800.00	43800.00	46575.00	47900.00	43625.00	45500.00	47325.00	50200.00	45100.00	49300.00
Magnesium	6100.00	6300.00	6900.00	7650.00	6225.00	6775.00	7575.00	7825.00	5925.00	6825.00
Anions (ppm)										
Chloride	21200.00	20600.00	20000.00	20800.00	20000.00	18400.00	20800.00	22800.00	20400.00	21200.00
Sulfate	60800.00	59200.00	57600.00	49200.00	48000.00	60800.00	60400.00	55771.00	62400.00	53429.00
Nitrate	415.00	475.00	314.00	314.00	300.00	386.00	170.00	316.00	145.00	460.00
Phosphate	1896.00	2370.00	2212.00	2133.00	1817.00	1738.00	1817.00	1738.00	1975.00	2054.00
Fluoride	22.00	24.00	25.00	24.00	25.00	25.00	25.00	25.00	26.00	26.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

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Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0043	0043	0043	0043	0043	0043	0043	0043	0043	0043
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	91	91	91	91	91	91	91	91	91	91
Row Number	30	30	61	61	63	63	76	76	105	105
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	45	125	115	209	87	210	78	153	113	202
NUS Sample ID Number	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160
Laboratory Number	778	779	780	781	782	783	784	785	786	787
Cations (ppm)										
Sodium	2800.00	2100.00	1650.00	2150.00	1950.00	1800.00	1700.00	1300.00	2050.00	2050.00
Potassium	22000.00	23500.00	21000.00	24500.00	24000.00	22500.00	21000.00	17143.00	19048.00	19524.00
Calcium	17325.00	23088.00	15625.00	16788.00	16838.00	15975.00	16638.00	18788.00	17325.00	18788.00
Magnesium	3250.00	3088.00	2925.00	3275.00	2950.00	2975.00	2875.00	2763.00	2950.00	2625.00
Anions (ppm)										
Chloride	18000.00	18400.00	16400.00	18000.00	18000.00	16400.00	18200.00	16800.00	18200.00	17200.00
Sulfate	16640.00	7667.00	8148.00	4444.00	5926.00	7143.00	9429.00	15079.00	11857.00	13598.00
Nitrate	163.00	266.00	109.00	200.00	226.00	139.00	124.00	100.00	106.00	148.00
Phosphate	2370.00	3081.00	2370.00	2528.00	2370.00	2923.00	3081.00	2133.00	2370.00	2212.00
Fluoride	14.00	14.00	14.00	13.00	14.00	14.00	14.00	13.00	14.00	13.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
Row Number	24	24	102	102	138	138	166	166	254	254
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	38	208	47	166	245	256	75	203	81	249
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9111	9112	9113	9114	9115	9116	9117	9118	9119	9120
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	680.90	809.50	944.60	1138.10	783.70	1138.50	256.70	564.10	659.00	660.00

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
Row Number	14	14	53	53	113	113	135	135	137	137
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	128	215	208	253	77	210	60	106	19	72
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9121	9122	9123	9124	9125	9126	9127	9128	9129	9130
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	926.70	853.30	746.30	873.80	810.60	678.90	945.30	804.00	685.00	709.80

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	91	91	91	91	91	91	91	91	91	91
Row Number	27	27	102	102	126	126	131	131	173	173
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	62	205	230	245	179	204	83	98	52	121
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9141	9142	9143	9144	9145	9146	9147	9148	9149	9150
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	544.10	432.50	461.70	390.30	477.40	521.30	500.30	481.00	509.70	469.60

APPENDIX F

SOILS DATA

Appendix F
Soils Data

Included in this appendix are tabulations of data on the soil texture at each of the 44 sites (1-28 and 30-45) where soil samples were collected, as well as laboratory analysis data on electrical conductivity (EC x 1000), soluble salts, pH, and the concentrations of 17 ions.

The soils texture data are presented for two depth levels, an upper level of 0 to 15 centimeters, and a lower level of 15 to 30 centimeters.

The results of laboratory analysis are presented for each of two collocated samples (A and B) for the upper and lower levels (U and L). Samples collected during the second, third, and fourth quarters of 1991 represent the wet, dry, and postdefoliation seasons, respectively. The postdefoliation season is defined as the period following the cotton crop harvest.

A minus sign preceding a value indicates that the value was below the detectable limit of the laboratory procedure. Missing data are presented as a field of "9s." Phosphorus has been discontinued as an analyte and is not reported.

Site	Soil Texture: Upper Level (0 - 15 cm)	Soil Texture: Lower Level (15 - 30 cm)
1	Sandy Loam	Sandy Loam
2	Silt Loam-Loam	Loam
3	Silt Loam-Loam	Sandy Loam
4	Sandy Loam	Sandy Loam
5	Sandy Loam	Sandy Loam
6	Sandy Loam	Sandy Loam
7	Sandy Loam	Sandy Loam
8	Sandy Loam	Loamy Sand
9	Loam	Loam-Sandy Loam
10	Loamy Sand-Sandy Loam	Sandy Loam
11	Silt Loam	Silt Loam
12	Loam	Sandy Loam
13	Loam-Sandy Clay Loam	Loam-Sandy Loam
14	Silt Loam	Loam
15	Sandy Loam	Sandy Loam
16	Sandy Loam	Sandy Loam-Sandy Clay Loam
17	Loamy Sand-Sandy Loam	Loamy Sand-Sandy Loam
18	Sandy Loam	Sandy Loam
19	Silt Loam-Loam	Silt Loam
20	Sandy Loam	Sandy Loam-Loamy Sand
21	Sandy Loam	Sandy Loam
22	Sandy Loam-Loamy Sand	Sandy Loam
23	Loam-Silt Loam	Silt Loam
24	Silt Loam-Loam	Loam
25	Loam	Loam
26	Sandy Loam	Loam
27	Sandy Loam	Sandy Loam
28	Sandy Loam	Loam-Sandy Loam
29	Loam	Loam
30	Silt Loam	Loam-Silt Loam
31	Sandy Loam	Sandy Loam
32	Sandy Loam	Sandy Loam
33	Sand	Sand
34	Sandy Loam	Sandy Loam
35	Loamy Sand-Sand	Sand
36	Sandy Loam	Sandy Loam
37	Sandy Loam	Sandy Loam
38	Sandy Loam	Sandy Loam
39	Sandy Loam	Sandy Loam
40	Sandy Loam-Loam	Sandy Loam
41	Sandy Loam	Sandy Loam
42	Sandy Loam	Sandy Loam
43	Silt Loam	Silt Loam
44	Silt Loam	Silt Loam
45	Loam-Clay Loam	Loam-Clay Loam

Raw Soil Sample Data

For Quarter 2/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
01AL	2	91	4	WET	362	207	1.50	960	8.2	94	7	160	110	273.0	140	-4.8	0.40	36.25	1.86	6.67	0.88	6
01AU	2	91	4	WET	361	206	1.50	960	8.1	124	10	124	170	53.0	123	-4.8	0.21	67.50	0.86	5.83	0.88	12
01BL	2	91	4	WET	364	209	1.10	704	8.2	84	6	124	150	40.0	129	-4.8	0.31	57.50	0.79	5.00	0.29	4
01BU	2	91	4	WET	363	208	1.10	704	8.1	88	7	82	146	25.0	121	-4.8	0.21	50.00	0.64	5.00	0.59	12
02AL	2	91	4	WET	366	211	0.64	410	8.8	23	3	116	36	29.0	244	4.0	0.50	10.63	0.64	5.83	1.18	8
02AU	2	91	4	WET	365	210	0.44	282	8.5	43	7	24	16	-2.5	188	-4.8	0.21	6.25	0.50	5.00	0.88	24
02BL	2	91	4	WET	368	213	1.40	896	9.4	44	10	220	120	64.0	401	29.0	0.96	16.88	1.57	2.50	1.18	20
02BU	2	91	4	WET	367	212	0.40	256	8.8	30	9	44	18	-2.5	190	6.0	0.28	3.75	0.46	2.50	1.47	22
03AL	2	91	4	WET	350	195	7.60	4864	8.9	26	5	1314	1972	307.0	250	25.0	14.00	92.50	28.57	2.50	1.18	18
03AU	2	91	4	WET	349	194	3.40	2176	9.1	23	4	600	742	113.0	323	21.0	3.90	32.50	16.79	5.00	2.06	24
03BL	2	91	4	WET	352	197	11.00	7040	8.7	67	14	1680	2744	727.0	234	-4.8	14.00	250.00	38.57	2.50	0.59	26
03BU	2	91	4	WET	351	196	1.70	1088	9.2	48	17	320	300	-2.5	451	23.0	4.00	9.38	4.21	5.00	2.06	28
04AL	2	91	4	WET	390	235	0.36	230	8.5	45	3	10	18	17.0	150	-4.8	0.28	4.38	0.50	2.50	1.18	10
04AU	2	91	4	WET	389	234	0.32	205	8.6	38	3	10	12	-2.5	156	2.0	0.29	4.13	0.46	1.25	1.47	14
04BL	2	91	4	WET	392	237	0.32	205	8.5	42	3	14	18	19.0	140	-4.8	0.32	3.25	0.57	1.25	0.88	8
04BU	2	91	4	WET	391	236	0.28	179	8.6	40	3	10	12	-2.5	142	-4.8	0.29	3.13	0.43	1.25	1.18	10
05AL	2	91	4	WET	382	227	1.20	768	8.8	23	2	220	144	58.0	229	2.0	12.00	24.38	1.79	-2.50	1.47	8
05AU	2	91	4	WET	381	226	1.00	640	8.6	26	3	180	136	55.0	217	-4.8	4.00	15.63	1.86	-2.50	1.47	19
05BL	2	91	4	WET	384	229	2.90	1856	8.4	63	8	463	540	327.0	188	-4.8	6.60	25.00	1.57	1.25	1.18	15
05BU	2	91	4	WET	383	228	0.44	282	8.8	26	3	67	18	-2.5	221	2.0	3.90	4.63	1.29	-2.50	2.06	15
06AL	2	91	4	WET	378	223	0.40	256	8.6	34	2	57	18	-2.5	186	-4.8	0.30	6.88	0.71	-2.50	0.88	2
06AU	2	91	4	WET	377	222	0.32	205	8.7	37	3	32	12	-2.5	173	-4.8	0.23	3.50	0.36	-2.50	1.18	4
06BL	2	91	4	WET	380	225	0.36	230	8.5	42	3	32	16	10.0	209	-4.8	0.27	5.00	0.64	-2.50	2.65	2
06BU	2	91	4	WET	379	224	0.28	179	8.5	35	2	18	8	-2.5	207	-4.8	0.23	2.75	0.50	-2.50	1.76	4
07AL	2	91	4	WET	430	275	0.44	282	8.9	22	3	73	16	3.0	198	-4.8	2.30	3.13	1.14	-2.50	2.06	4
07AU	2	91	4	WET	429	274	0.48	307	8.8	28	5	69	16	-2.5	238	-4.8	1.40	3.63	0.93	1.67	2.35	12
07BL	2	91	4	WET	432	277	0.64	410	8.8	26	4	103	60	43.0	184	-4.8	2.70	8.13	1.43	-2.50	2.06	4
07BU	2	91	4	WET	431	276	0.44	282	8.7	30	5	60	8	-2.5	232	-4.8	2.00	2.50	1.04	-2.50	3.53	12
08AL	2	91	4	WET	414	259	3.00	1920	9.8	17	3	667	620	264.0	277	70.0	1.35	35.00	9.07	-2.50	3.53	36
08AU	2	91	4	WET	413	258	0.40	256	9.0	21	3	73	52	-2.5	175	-4.8	0.76	5.63	0.80	1.00	3.23	12
08BL	2	91	4	WET	416	261	1.60	1024	9.4	17	2	260	312	100.0	211	12.0	1.10	9.38	3.20	-2.50	1.76	10
08BU	2	91	4	WET	415	260	0.38	243	8.9	23	3	58	52	-2.5	150	-4.8	0.48	5.00	0.80	-2.50	2.65	10
09AL	2	91	4	WET	374	219	0.56	358	8.9	23	5	90	44	6.0	213	2.0	0.34	8.13	2.93	1.25	2.35	40
09AU	2	91	4	WET	373	218	0.32	205	8.7	34	6	30	10	-2.5	171	2.0	0.26	3.13	0.50	1.25	2.65	23
09BL	2	91	4	WET	376	221	0.52	333	8.7	35	7	53	44	25.0	194	-4.8	0.29	11.25	0.54	-2.50	2.06	27
09BU	2	91	4	WET	375	220	0.36	230	8.6	33	5	28	18	-2.5	179	-4.8	0.24	2.88	0.64	-2.50	1.76	21
10AL	2	91	4	WET	370	215	0.56	358	8.6	34	5	72	42	46.0	138	-4.8	0.78	14.06	0.71	1.25	0.59	8
10AU	2	91	4	WET	369	214	0.32	205	8.6	31	4	22	8	-2.5	159	-4.8	0.44	3.13	0.43	1.25	1.76	13
10BL	2	91	4	WET	372	217	0.52	333	8.8	24	3	95	58	35.0	177	-4.8	0.78	7.50	0.50	2.50	0.59	8
10BU	2	91	4	WET	371	216	0.28	179	8.7	29	3	18	20	-2.5	150	-4.8	0.48	3.38	0.21	1.25	1.76	11
11AL	2	91	4	WET	410	255	1.30	832	8.4	35	4	220	184	109.0	204	-4.8	8.80	25.00	1.53	-2.50	1.47	30
11AU	2	91	4	WET	409	254	1.70	1088	8.3	57	7	200	266	147.0	159	-4.8	6.20	36.25	1.60	1.00	1.18	36
11BL	2	91	4	WET	412	257	1.40	896	8.6	30	3	280	202	166.0	252	-4.8	13.00	23.13	2.07	-2.50	1.47	34
11BU	2	91	4	WET	411	256	1.90	1216	8.5	39	4	280	306	180.0	221	-4.8	11.00	35.00	1.87	-2.50	1.18	38

Raw Soil Sample Data

For Quarter 2/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
12AL	2	91	4	WET	418	263	1.30	832	8.9	27	3	220	136	179.0	257	-4.8	15.00	18.75	2.07	2.00	2.94	42
12AU	2	91	4	WET	417	262	0.96	614	8.8	27	2	158	98	69.0	236	-4.8	7.00	11.88	2.00	-2.50	4.41	34
12BL	2	91	4	WET	420	265	0.68	435	8.9	29	4	140	64	59.0	242	-4.8	14.00	6.25	1.60	1.00	2.94	28
12BU	2	91	4	WET	419	264	0.76	486	8.8	26	3	124	80	-2.5	221	-4.8	6.50	9.06	1.33	-2.50	4.12	36
13AL	2	91	4	WET	394	239	1.10	704	8.8	25	2	160	150	70.0	219	2.0	9.60	6.13	1.29	1.25	1.18	20
13AU	2	91	4	WET	393	238	1.70	1088	8.4	38	4	260	310	140.0	169	-4.8	5.60	9.38	1.50	1.25	1.47	28
13BL	2	91	4	WET	396	241	1.30	832	8.7	24	2	200	176	75.0	234	-4.8	12.50	7.19	1.50	1.25	1.47	26
13BU	2	91	4	WET	395	240	1.60	1024	8.5	34	4	260	274	154.0	211	-4.8	8.40	10.63	1.64	2.50	1.47	30
14AL	2	91	4	WET	358	203	0.72	461	8.4	48	8	71	42	31.0	215	-4.8	0.31	17.50	0.64	2.50	1.47	40
14AU	2	91	4	WET	357	202	0.96	614	8.4	44	9	67	54	61.0	244	-4.8	0.46	26.25	1.57	5.00	1.76	110
14BL	2	91	4	WET	360	205	1.20	768	8.3	54	10	130	110	66.0	173	-4.8	0.30	52.50	0.64	2.50	1.18	48
14BU	2	91	4	WET	359	204	1.80	1152	8.2	79	16	118	136	77.0	161	-4.8	0.29	80.00	0.93	2.50	2.06	160
15AL	2	91	4	WET	466	311	0.30	192	8.5	36	3	8	14	21.0	136	-4.8	0.25	4.50	0.43	-2.50	1.18	10
15AU	2	91	4	WET	465	310	0.28	179	8.6	35	3	4	6	-2.5	167	-4.8	0.20	3.13	0.50	2.50	1.47	14
15BL	2	91	4	WET	468	313	0.30	192	8.5	41	4	10	12	20.0	131	-4.8	0.31	4.38	0.43	2.50	0.88	10
15BU	2	91	4	WET	467	312	0.24	154	8.7	27	2	6	12	-2.5	123	-4.8	0.22	2.75	0.50	5.00	1.18	10
16AL	2	91	4	WET	354	199	12.00	7680	8.8	54	12	1760	2816	568.0	277	16.0	4.80	337.50	17.86	2.50	1.47	70
16AU	2	91	4	WET	353	198	2.20	1408	9.3	22	3	422	428	4.0	315	41.0	1.20	42.50	9.64	-2.50	3.23	30
16BL	2	91	4	WET	356	201	15.00	9600	8.8	69	17	2400	3480	695.0	240	10.0	2.00	450.00	35.71	-2.50	1.76	110
16BU	2	91	4	WET	355	200	3.80	2432	9.1	19	2	711	398	145.0	302	35.0	1.20	95.00	16.43	-2.50	3.23	50
17AL	2	91	4	WET	462	307	1.10	704	8.2	65	21	18	22	-2.5	204	-4.8	0.30	67.50	1.79	7.25	6.17	144
17AU	2	91	4	WET	461	306	1.00	640	8.5	102	25	14	32	-2.5	213	-4.8	0.48	60.00	2.07	6.50	10.58	110
17BL	2	91	4	WET	464	309	0.88	563	8.3	84	20	10	18	-2.5	173	-4.8	2.10	60.00	1.54	5.75	6.76	96
17BU	2	91	4	WET	463	308	0.92	589	8.3	104	17	10	16	-2.5	179	-4.8	0.29	62.50	1.57	5.75	12.64	62
18AL	2	91	4	WET	398	243	0.36	230	8.5	55	4	14	24	1.0	144	-4.8	0.52	5.25	0.32	1.25	1.47	4
18AU	2	91	4	WET	397	242	0.28	179	8.7	38	3	12	10	-2.5	148	-4.8	0.74	3.50	0.64	2.50	1.47	6
18BL	2	91	4	WET	400	245	0.36	230	8.6	47	3	18	30	21.0	144	-4.8	0.44	4.63	0.64	1.25	1.76	4
18BU	2	91	4	WET	399	244	0.30	192	8.5	45	3	12	16	1.0	159	-4.8	0.36	3.50	0.54	-2.50	2.06	8
19AL	2	91	4	WET	402	247	0.40	256	8.7	35	4	14	16	-2.5	192	-4.8	0.40	6.00	1.07	1.25	2.35	56
19AU	2	91	4	WET	401	246	0.32	205	8.6	32	3	14	6	-2.5	186	-4.8	0.29	2.75	0.64	2.50	2.65	28
19BL	2	91	4	WET	404	249	0.56	358	8.8	28	4	28	20	-2.5	186	-4.8	0.58	11.25	1.00	1.25	2.35	82
19BU	2	91	4	WET	403	248	0.40	256	8.6	34	4	14	12	-2.5	177	-4.8	0.29	8.75	0.71	1.25	3.23	44
20AL	2	91	4	WET	406	251	0.60	384	9.4	18	4	106	22	-2.5	273	12.0	5.80	2.63	1.50	1.25	2.94	22
20AU	2	91	4	WET	405	250	0.36	230	9.2	20	3	56	18	-2.5	179	4.0	2.20	2.50	1.21	2.50	3.23	24
20BL	2	91	4	WET	408	253	0.68	435	9.5	19	5	142	16	-2.5	409	21.0	8.00	2.88	2.07	1.25	2.65	44
20BU	2	91	4	WET	407	252	0.44	282	9.2	23	5	64	20	-2.5	202	4.0	2.50	2.63	1.21	1.25	3.23	24
21AL	2	91	4	WET	474	319	1.00	640	9.9	62	29	220	64	13.0	367	45.0	0.94	4.38	1.93	2.50	2.06	40
21AU	2	91	4	WET	473	318	0.40	256	9.4	22	8	90	14	-2.5	213	4.0	0.50	3.75	0.57	-2.50	2.65	22
21BL	2	91	4	WET	476	321	1.30	832	10.0	25	10	240	85	13.0	393	63.0	1.30	5.00	2.57	2.50	2.65	34
21BU	2	91	4	WET	475	320	0.44	282	9.4	18	6	96	16	-2.5	217	6.0	0.20	3.13	0.50	2.50	1.47	20
22AL	2	91	4	WET	478	323	0.28	179	8.7	37	3	16	22	24.0	104	-4.8	0.35	3.13	0.50	2.50	0.88	4
22AU	2	91	4	WET	477	322	0.24	154	8.9	26	2	8	12	-2.5	115	-4.8	0.28	3.00	0.36	2.50	1.47	6
22BL	2	91	4	WET	480	325	0.28	179	8.8	37	3	16	16	25.0	104	-4.8	0.33	2.88	3.93	-2.50	1.18	4
22BU	2	91	4	WET	479	324	0.24	154	8.8	29	2	8	12	-2.5	119	-4.8	0.24	2.50	0.36	-2.50	1.47	6

Raw Soil Sample Data

For Quarter 2/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
23AL	2	91	4	WET	450	295	0.96	614	8.8	22	3	160	92	-2.5	248	-4.8	12.50	4.63	1.79	-2.50	1.47	8
23AU	2	91	4	WET	449	294	0.80	512	8.8	26	5	180	76	-2.5	273	-4.8	12.00	4.25	1.79	-2.50	1.76	8
23BL	2	91	4	WET	452	297	1.30	832	8.8	32	3	220	112	260.0	292	-4.8	9.60	7.50	2.21	-2.50	2.35	10
23BU	2	91	4	WET	451	296	0.94	602	8.7	23	3	160	88	-2.5	290	-4.8	10.00	4.75	1.86	-2.50	1.76	8
24AL	2	91	4	WET	470	315	1.80	1152	8.7	47	6	280	208	147.0	144	-4.8	3.00	62.50	1.43	5.00	1.47	26
24AU	2	91	4	WET	469	314	0.64	410	9.1	23	4	112	28	-2.5	229	4.0	4.20	8.13	1.71	-2.50	1.76	32
24BL	2	91	4	WET	472	317	1.40	896	8.9	27	3	200	96	121.0	150	-4.8	3.00	21.25	2.00	2.50	1.76	20
24BU	2	91	4	WET	471	316	0.68	435	9.1	31	9	114	20	78.0	204	-4.8	4.40	11.88	1.00	2.50	2.35	22
25AL	2	91	4	WET	438	283	2.70	1728	8.1	278	56	180	312	394.0	94	-4.8	1.00	100.00	1.36	-2.50	1.47	28
25AU	2	91	4	WET	437	282	1.80	1152	8.3	158	29	155	130	394.0	102	-4.8	1.10	45.00	1.29	1.67	1.76	22
25BL	2	91	4	WET	440	285	2.00	1280	8.2	152	28	158	204	277.0	100	-4.8	1.15	92.50	1.36	3.33	1.47	22
25BU	2	91	4	WET	439	284	1.30	832	8.3	103	19	116	70	285.0	129	-4.8	1.20	35.00	1.36	1.67	2.35	22
26AL	2	91	4	WET	546	400	0.20	128	8.7	40	3	14	10	-2.5	136	-4.8	0.46	2.13	0.53	1.67	1.76	2
26AU	2	91	4	WET	545	399	0.24	154	8.7	46	3	10	12	-2.5	148	-4.8	0.44	2.19	0.60	-2.50	2.06	2
26BL	2	91	4	WET	548	402	0.28	179	8.7	40	3	18	8	-2.5	138	-4.8	0.68	2.13	0.60	3.33	2.06	2
26BU	2	91	4	WET	547	401	0.20	128	8.7	34	3	10	10	-2.5	134	-4.8	0.48	2.00	0.53	-2.50	2.06	2
27AL	2	91	4	WET	386	231	1.70	1088	9.4	23	5	300	136	145.0	342	25.0	20.00	30.00	4.14	-2.50	1.76	6
27AU	2	91	4	WET	385	230	0.50	320	9.2	50	19	116	12	-2.5	309	16.0	4.20	4.38	1.79	-2.50	2.35	46
27BL	2	91	4	WET	388	233	3.80	2432	9.1	26	2	611	670	618.0	209	18.0	17.00	55.00	7.50	-2.50	1.76	11
27BU	2	91	4	WET	387	232	0.88	563	9.2	23	6	160	68	7.0	271	12.0	7.60	10.00	2.79	-2.50	1.76	11
28AL	2	91	4	WET	454	299	0.88	563	8.8	32	3	152	84	59.0	154	-4.8	0.84	28.75	1.29	2.50	0.88	6
28AU	2	91	4	WET	453	298	0.48	307	9.1	22	3	104	20	44.0	217	4.0	1.70	5.13	1.43	-2.50	1.47	10
28BL	2	91	4	WET	456	301	0.64	410	9.0	19	2	137	36	55.0	215	-4.8	1.10	15.63	1.14	2.50	0.59	4
28BU	2	91	4	WET	455	300	0.44	282	9.2	21	2	92	20	23.0	215	2.0	1.60	5.63	1.21	-2.50	1.47	8
30AL	2	91	4	WET	446	291	2.60	1664	8.6	54	8	467	486	313.0	161	-4.8	4.40	18.75	2.43	3.33	0.88	6
30AU	2	91	4	WET	445	290	1.80	1152	8.7	37	5	300	224	281.0	221	-4.8	5.20	20.00	2.57	5.00	1.18	6
30BL	2	91	4	WET	448	293	1.90	1216	8.6	38	6	260	306	148.0	194	-4.8	5.00	15.63	2.00	5.00	0.59	6
30BU	2	91	4	WET	447	292	1.40	896	8.8	33	4	260	182	145.0	219	-4.8	6.40	18.75	2.21	5.00	0.88	6
31AL	2	91	4	WET	518	363	2.20	1408	8.9	26	2	422	362	291.0	184	2.0	6.60	36.25	2.79	5.00	1.18	8
31AU	2	91	4	WET	517	362	2.40	1536	9.1	23	2	422	292	382.0	194	8.0	5.20	42.50	3.86	1.67	2.06	10
31BL	2	91	4	WET	520	365	2.10	1344	8.9	23	2	340	358	146.0	175	-4.8	7.00	42.50	1.79	1.67	1.18	8
31BU	2	91	4	WET	519	364	1.00	640	9.4	16	3	180	78	7.0	292	18.0	7.60	9.38	2.50	-2.50	1.76	6
32AL	2	91	4	WET	514	359	1.10	704	9.2	14	1	200	66	140.0	255	4.0	15.00	8.13	1.79	5.00	0.59	2
32AU	2	91	4	WET	513	358	0.72	461	9.6	15	5	158	12	-2.5	284	12.0	9.00	3.13	1.57	5.00	0.88	16
32BL	2	91	4	WET	516	361	0.96	614	9.1	17	2	160	60	80.0	253	2.0	13.00	6.25	1.43	1.67	0.59	2
32BU	2	91	4	WET	515	360	0.64	410	9.5	18	9	136	10	7.0	250	10.0	7.00	2.75	1.57	1.67	0.88	4
33AL	2	91	4	WET	510	355	0.20	128	9.0	26	2	8	12	-2.5	81	-4.8	0.35	2.50	0.71	1.67	2.06	6
33AU	2	91	4	WET	509	354	0.18	115	9.0	21	2	6	12	-2.5	79	-4.8	0.28	2.75	0.96	1.67	2.94	6
33BL	2	91	4	WET	512	357	0.18	115	8.9	25	2	4	4	-2.5	88	-4.8	0.23	2.19	0.64	1.67	2.35	6
33BU	2	91	4	WET	511	356	0.18	115	8.8	26	2	4	8	-2.5	75	-4.8	0.24	2.06	0.71	5.00	4.41	6
34AL	2	91	4	WET	490	335	0.28	179	8.8	29	2	36	16	-2.5	142	-4.8	0.48	2.63	0.67	1.67	0.88	2
34AU	2	91	4	WET	489	334	0.28	179	8.6	34	2	8	20	-2.5	138	-4.8	0.25	3.38	0.47	1.67	0.88	6
34BL	2	91	4	WET	492	337	0.32	205	8.6	39	3	20	24	21.0	121	-4.8	0.31	2.63	0.60	6.67	0.59	6
34BU	2	91	4	WET	491	336	0.24	154	8.7	32	2	10	14	-2.5	125	-4.8	0.25	2.88	0.60	1.67	0.88	6

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Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
35AL	2	91	4	WET	494	339	0.18	115	8.8	30	2	8	8	1.0	100	-4.8	0.27	2.06	0.47	-2.50	2.94	4
35AU	2	91	4	WET	493	338	0.18	115	8.8	29	2	4	12	-2.5	92	-4.8	0.20	1.88	0.43	-2.50	4.70	6
35BL	2	91	4	WET	496	341	0.18	115	8.8	31	2	10	8	-2.5	83	-4.8	0.25	2.19	0.30	-2.50	3.23	6
35BU	2	91	4	WET	495	340	0.18	115	8.7	28	2	8	12	-2.5	88	-4.8	0.23	2.00	0.30	-2.50	4.12	10
36AL	2	91	4	WET	498	343	1.40	896	8.4	97	5	160	266	77.0	94	-4.8	0.48	52.50	1.00	1.67	0.59	6
36AU	2	91	4	WET	497	342	0.24	154	8.7	29	2	22	12	-2.5	129	-4.8	0.22	2.50	0.50	-2.50	0.88	6
36BL	2	91	4	WET	500	345	0.40	256	9.0	20	1	80	30	31.0	154	2.0	1.00	3.13	1.00	1.67	0.59	4
36BU	2	91	4	WET	499	344	0.24	154	8.7	33	2	22	16	-2.5	117	-4.8	0.21	3.75	0.50	-2.50	0.88	6
37AL	2	91	4	WET	502	347	0.26	166	8.6	38	2	14	14	21.0	125	-4.8	0.24	2.50	0.40	1.67	0.59	4
37AU	2	91	4	WET	501	346	0.26	166	8.6	37	2	8	14	-2.5	131	-4.8	0.30	2.63	0.47	3.33	0.88	6
37BL	2	91	4	WET	504	349	0.24	154	8.7	46	2	14	12	-2.5	125	-4.8	0.28	2.50	0.27	-2.50	0.59	-5
37BU	2	91	4	WET	503	348	0.24	154	8.6	37	2	8	12	1.0	121	-4.8	0.22	2.44	0.40	-2.50	1.18	4
38AL	2	91	4	WET	530	375	1.50	960	9.4	13	2	280	100	173.0	355	34.0	1.30	14.38	2.60	3.33	2.35	2
38AU	2	91	4	WET	529	374	0.48	307	9.2	17	4	138	14	-2.5	259	8.0	0.32	4.38	0.80	5.00	2.06	4
38BL	2	91	4	WET	532	377	1.50	960	9.4	12	1	260	233	64.0	303	27.0	0.76	18.13	1.33	5.00	2.35	2
38BU	2	91	4	WET	531	376	0.52	333	9.2	14	4	135	12	-2.5	275	14.0	0.35	3.75	0.80	5.00	2.65	2
39AL	2	91	4	WET	534	379	3.00	1920	9.0	25	4	632	614	264.0	192	4.0	1.85	31.25	6.93	1.67	1.18	2
39AU	2	91	4	WET	533	378	1.00	640	8.9	19	2	200	132	45.0	207	-4.8	0.35	14.38	1.40	1.67	1.47	4
39BL	2	91	4	WET	536	381	5.00	3200	8.8	47	10	905	1334	227.0	131	-4.8	0.70	31.25	4.07	1.67	1.76	4
39BU	2	91	4	WET	535	380	0.96	614	8.8	22	2	180	176	37.0	184	-4.8	3.20	6.25	0.93	1.67	1.76	4
40AL	2	91	4	WET	442	287	0.90	576	8.4	121	9	30	60	145.0	88	-4.8	0.25	30.00	1.00	-2.50	2.06	12
40AU	2	91	4	WET	441	286	0.36	230	8.7	36	3	30	8	3.0	163	-4.8	0.32	6.25	0.79	3.33	2.06	10
40BL	2	91	4	WET	444	289	1.00	640	8.3	109	11	38	112	142.0	100	-4.8	0.20	22.50	0.79	3.33	2.06	16
40BU	2	91	4	WET	443	288	0.40	256	8.7	49	4	30	10	-2.5	177	-4.8	0.24	6.13	1.07	3.33	2.06	14
41AL	2	91	4	WET	426	271	2.60	1664	9.3	17	1	489	538	153.0	219	25.0	2.70	17.50	8.93	-2.50	0.88	8
41AU	2	91	4	WET	425	270	0.68	435	8.8	25	2	116	116	40.0	152	-4.8	0.22	8.75	1.37	-2.50	0.88	6
41BL	2	91	4	WET	428	273	2.00	1280	8.8	24	2	340	488	49.0	146	-4.8	0.68	18.75	2.73	2.00	0.59	12
41BU	2	91	4	WET	427	272	0.48	307	8.5	51	5	36	82	24.0	117	-4.8	0.33	5.00	1.00	-2.50	0.88	10
42AL	2	91	4	WET	538	383	0.28	179	8.5	49	3	12	8	-2.5	150	-4.8	0.29	2.50	0.53	-2.50	1.47	2
42AU	2	91	4	WET	537	382	0.28	179	8.5	50	3	10	26	-2.5	161	-4.8	0.32	2.63	0.67	3.33	1.47	2
42BL	2	91	4	WET	540	385	0.28	179	8.5	43	3	16	12	-2.5	156	-4.8	0.31	2.50	0.37	1.67	1.47	2
42BU	2	91	4	WET	539	384	0.26	166	8.5	49	3	8	10	-2.5	159	-4.8	0.24	2.19	0.43	3.33	1.47	2
43AL	2	91	4	WET	542	387	1.80	1152	8.7	44	9	280	254	277.0	273	-4.8	1.30	5.63	2.07	3.33	3.82	8
43AU	2	91	4	WET	541	386	1.70	1088	8.7	46	10	240	210	240.0	282	-4.8	1.15	5.50	2.13	5.00	5.00	8
43BL	2	91	4	WET	544	389	1.40	896	8.8	40	6	180	166	235.0	305	2.0	1.70	5.50	2.27	1.67	3.53	4
43BU	2	91	4	WET	543	388	1.50	960	8.7	38	9	200	204	206.0	307	-4.8	1.50	6.56	2.27	6.88	5.88	11
44AL	2	91	4	WET	422	267	0.68	435	8.8	28	5	116	118	74.0	171	-4.8	0.33	18.75	1.73	-2.50	2.65	46
44AU	2	91	4	WET	421	266	0.44	282	8.6	35	5	26	48	33.0	159	-4.8	0.50	5.63	0.87	2.00	2.94	44
44BL	2	91	4	WET	424	269	2.90	1856	8.4	97	25	400	622	61.0	104	-4.8	0.20	82.50	2.20	-2.50	2.35	100
44BU	2	91	4	WET	423	268	0.64	410	8.7	33	5	53	62	52.0	156	-4.8	0.21	16.56	1.33	-2.50	2.94	62
45AL	2	91	4	WET	458	303	3.00	1920	8.9	26	3	560	226	800.0	238	2.0	7.80	13.12	3.43	2.50	0.29	4
45AU	2	91	4	WET	457	302	1.00	640	9.6	14	2	200	28	59.0	409	33.0	13.00	4.38	2.07	2.50	0.29	4
45BL	2	91	4	WET	460	305	2.80	1792	9.2	18	2	540	238	786.0	284	16.0	6.80	16.88	4.21	5.00	0.29	4
45BU	2	91	4	WET	459	304	1.00	640	9.5	15	3	180	36	87.0	357	31.0	13.00	4.63	2.00	2.50	0.29	4

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
01AL	2	91	4	WET	362	207	1.33	0.56	26.45	1.60	9999.99
01AU	2	91	4	WET	361	206	0.96	0.77	22.37	1.48	9999.99
01BL	2	91	4	WET	364	209	1.10	0.51	23.54	1.32	9999.99
01BU	2	91	4	WET	363	208	0.78	0.82	30.81	1.93	9999.99
02AL	2	91	4	WET	366	211	1.47	0.87	19.17	2.14	9999.99
02AU	2	91	4	WET	365	210	0.39	1.28	19.75	2.16	9999.99
02BL	2	91	4	WET	368	213	3.91	1.05	17.80	2.26	9999.99
02BU	2	91	4	WET	367	212	0.61	1.28	18.99	2.22	9999.99
03AL	2	91	4	WET	350	195	13.74	0.95	16.44	1.77	9999.99
03AU	2	91	4	WET	349	194	6.52	1.05	17.32	1.52	9999.99
03BL	2	91	4	WET	352	197	14.19	0.95	17.44	1.91	9999.99
03BU	2	91	4	WET	351	196	6.09	1.08	20.10	1.71	9999.99
04AL	2	91	4	WET	390	235	0.22	0.78	20.81	0.97	9999.99
04AU	2	91	4	WET	389	234	0.22	0.84	23.05	1.07	9999.99
04BL	2	91	4	WET	392	237	0.26	0.70	21.29	1.03	9999.99
04BU	2	91	4	WET	391	236	0.22	0.73	20.32	1.03	9999.99
05AL	2	91	4	WET	382	227	2.17	0.61	20.42	1.48	9999.99
05AU	2	91	4	WET	381	226	1.56	0.77	21.88	1.69	9999.99
05BL	2	91	4	WET	384	229	3.91	0.54	22.18	1.62	9999.99
05BU	2	91	4	WET	383	228	0.65	0.79	19.72	1.56	9999.99
06AL	2	91	4	WET	378	223	0.74	0.33	25.70	1.42	9999.99
06AU	2	91	4	WET	377	222	0.39	0.51	21.28	1.19	9999.99
06BL	2	91	4	WET	380	225	0.48	0.31	26.07	1.44	9999.99
06BU	2	91	4	WET	379	224	0.35	0.49	24.80	1.38	9999.99
07AL	2	91	4	WET	430	275	0.83	0.38	19.55	2.51	9999.99
07AU	2	91	4	WET	429	274	0.74	0.67	17.34	2.22	9999.99
07BL	2	91	4	WET	432	277	1.01	0.41	20.67	2.40	9999.99
07BU	2	91	4	WET	431	276	0.65	0.69	15.93	1.79	9999.99
08AL	2	91	4	WET	414	259	6.96	1.43	13.14	1.01	9999.99
08AU	2	91	4	WET	413	258	0.78	0.69	14.98	1.09	9999.99
08BL	2	91	4	WET	416	261	2.78	0.51	16.67	1.13	9999.99
08BU	2	91	4	WET	415	260	0.61	0.61	18.04	1.46	9999.99
09AL	2	91	4	WET	374	219	0.92	1.82	17.73	2.26	9999.99
09AU	2	91	4	WET	373	218	0.39	1.25	21.29	2.34	9999.99
09BL	2	91	4	WET	376	221	0.57	1.28	21.10	2.42	9999.99
09BU	2	91	4	WET	375	220	0.35	1.28	20.36	2.18	9999.99
10AL	2	91	4	WET	370	215	0.65	0.49	17.33	1.44	9999.99
10AU	2	91	4	WET	369	214	0.26	0.64	21.03	1.62	9999.99
10BL	2	91	4	WET	372	217	0.92	0.51	21.67	1.62	9999.99
10BU	2	91	4	WET	371	216	0.22	0.64	17.61	1.23	9999.99
11AL	2	91	4	WET	410	255	2.48	2.02	18.55	1.60	9999.99
11AU	2	91	4	WET	409	254	2.69	2.05	21.92	1.93	9999.99
11BL	2	91	4	WET	412	257	3.23	2.30	18.89	1.75	9999.99
11BU	2	91	4	WET	411	256	3.44	2.05	20.90	1.87	9999.99

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
12AL	2	91	4	WET	418	263	2.73	2.30	18.97	1.34	9999.99
12AU	2	91	4	WET	417	262	1.87	2.05	18.43	1.15	9999.99
12BL	2	91	4	WET	420	265	1.87	2.02	18.97	1.23	9999.99
12BU	2	91	4	WET	419	264	1.65	2.05	21.46	1.40	9999.99
13AL	2	91	4	WET	394	239	2.13	1.51	20.86	1.89	9999.99
13AU	2	91	4	WET	393	238	2.26	1.36	18.99	1.60	9999.99
13BL	2	91	4	WET	396	241	2.04	1.54	18.28	1.73	9999.99
13BU	2	91	4	WET	395	240	2.35	1.48	18.11	1.64	9999.99
14AL	2	91	4	WET	358	203	0.74	2.05	17.54	1.93	9999.99
14AU	2	91	4	WET	357	202	0.61	3.58	18.74	2.38	9999.99
14BL	2	91	4	WET	360	205	1.19	2.05	17.14	1.91	9999.99
14BU	2	91	4	WET	359	204	0.83	4.35	20.32	2.75	9999.99
15AL	2	91	4	WET	466	311	0.22	0.90	21.62	1.32	9999.99
15AU	2	91	4	WET	465	310	0.22	1.00	23.19	1.17	9999.99
15BL	2	91	4	WET	468	313	0.26	0.82	20.01	1.15	9999.99
15BU	2	91	4	WET	467	312	0.22	0.92	21.49	1.17	9999.99
16AL	2	91	4	WET	354	199	17.40	1.23	19.98	2.30	9999.99
16AU	2	91	4	WET	353	198	3.91	1.13	17.76	1.32	9999.99
16BL	2	91	4	WET	356	201	21.32	1.64	17.93	2.34	9999.99
16BU	2	91	4	WET	355	200	6.09	1.38	19.72	1.64	9999.99
17AL	2	91	4	WET	462	307	0.30	5.89	21.33	4.50	9999.99
17AU	2	91	4	WET	461	306	0.26	3.84	19.19	3.68	9999.99
17BL	2	91	4	WET	464	309	0.26	5.12	19.76	3.41	9999.99
17BU	2	91	4	WET	463	308	0.30	4.35	24.60	3.53	9999.99
18AL	2	91	4	WET	398	243	0.26	0.49	21.37	1.36	9999.99
18AU	2	91	4	WET	397	242	0.22	0.73	26.20	1.48	9999.99
18BL	2	91	4	WET	400	245	0.30	0.54	26.57	1.44	9999.99
18BU	2	91	4	WET	399	244	0.26	0.78	20.76	1.13	9999.99
19AL	2	91	4	WET	402	247	0.35	3.58	18.14	1.60	9999.99
19AU	2	91	4	WET	401	246	0.30	2.02	19.82	1.48	9999.99
19BL	2	91	4	WET	404	249	0.48	5.39	20.25	1.97	9999.99
19BU	2	91	4	WET	403	248	0.35	2.82	21.93	1.75	9999.99
20AL	2	91	4	WET	406	251	1.35	1.31	18.64	1.79	9999.99
20AU	2	91	4	WET	405	250	0.65	1.13	18.96	1.62	9999.99
20BL	2	91	4	WET	408	253	2.00	1.64	19.77	2.16	9999.99
20BU	2	91	4	WET	407	252	0.83	1.28	17.48	1.56	9999.99
21AL	2	91	4	WET	474	319	2.98	1.29	16.68	1.48	9999.99
21AU	2	91	4	WET	473	318	0.92	1.19	17.28	1.54	9999.99
21BL	2	91	4	WET	476	321	3.91	1.56	15.04	1.38	9999.99
21BU	2	91	4	WET	475	320	1.01	1.10	19.35	1.71	9999.99
22AL	2	91	4	WET	478	323	0.30	0.33	19.44	0.68	9999.99
22AU	2	91	4	WET	477	322	0.26	0.44	18.09	0.66	9999.99
22BL	2	91	4	WET	480	325	0.26	0.36	20.57	0.70	9999.99
22BU	2	91	4	WET	479	324	0.22	0.44	20.82	0.74	9999.99

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
23AL	2	91	4	WET	450	295	3.19	1.05	17.69	1.66	9999.99
23AU	2	91	4	WET	449	294	2.94	1.10	16.59	1.50	9999.99
23BL	2	91	4	WET	452	297	3.23	1.18	18.06	1.79	9999.99
23BU	2	91	4	WET	451	296	2.94	1.08	17.99	1.73	9999.99
24AL	2	91	4	WET	470	315	2.61	1.51	19.22	2.10	9999.99
24AU	2	91	4	WET	469	314	1.69	2.05	22.02	1.77	9999.99
24BL	2	91	4	WET	472	317	2.57	1.56	19.95	1.71	9999.99
24BU	2	91	4	WET	471	316	1.60	1.79	19.15	1.46	9999.99
25AL	2	91	4	WET	438	283	1.64	1.41	23.20	3.35	9999.99
25AU	2	91	4	WET	437	282	1.50	1.54	20.51	2.77	9999.99
25BL	2	91	4	WET	440	285	1.55	1.43	23.50	3.19	9999.99
25BU	2	91	4	WET	439	284	1.30	1.66	20.32	2.75	9999.99
26AL	2	91	4	WET	546	400	0.39	0.38	18.82	0.90	9999.99
26AU	2	91	4	WET	545	399	0.35	0.59	20.10	0.95	9999.99
26BL	2	91	4	WET	548	402	0.39	0.38	16.04	0.86	9999.99
26BU	2	91	4	WET	547	401	0.30	0.41	19.12	0.95	9999.99
27AL	2	91	4	WET	386	231	5.65	0.77	18.14	1.01	9999.99
27AU	2	91	4	WET	385	230	1.42	1.18	19.44	1.19	9999.99
27BL	2	91	4	WET	388	233	7.39	0.74	17.83	0.84	9999.99
27BU	2	91	4	WET	387	232	2.26	0.90	21.26	1.23	9999.99
28AL	2	91	4	WET	454	299	2.61	1.05	20.73	1.27	9999.99
28AU	2	91	4	WET	453	298	1.91	1.23	20.26	1.23	9999.99
28BL	2	91	4	WET	456	301	2.65	0.77	21.67	1.42	9999.99
28BU	2	91	4	WET	455	300	1.91	1.25	18.95	1.19	9999.99
30AL	2	91	4	WET	446	291	5.65	0.84	22.92	2.42	9999.99
30AU	2	91	4	WET	445	290	5.22	1.08	18.95	2.59	9999.99
30BL	2	91	4	WET	448	293	4.78	0.90	23.76	2.57	9999.99
30BU	2	91	4	WET	447	292	4.35	0.95	23.91	2.61	9999.99
31AL	2	91	4	WET	518	363	3.27	0.41	13.42	0.66	9999.99
31AU	2	91	4	WET	517	362	3.36	0.54	15.37	0.78	9999.99
31BL	2	91	4	WET	520	365	2.86	0.41	12.45	0.68	9999.99
31BU	2	91	4	WET	519	364	2.22	0.54	13.11	0.72	9999.99
32AL	2	91	4	WET	514	359	2.17	0.18	17.08	0.99	9999.99
32AU	2	91	4	WET	513	358	1.64	0.20	14.41	0.78	9999.99
32BL	2	91	4	WET	516	361	1.74	0.15	13.56	0.76	9999.99
32BU	2	91	4	WET	515	360	1.35	0.20	10.15	0.66	9999.99
33AL	2	91	4	WET	510	355	0.17	0.18	6.29	0.37	9999.99
33AU	2	91	4	WET	509	354	0.17	0.15	3.89	0.25	9999.99
33BL	2	91	4	WET	512	357	0.13	0.13	4.05	0.29	9999.99
33BU	2	91	4	WET	511	356	0.13	0.15	3.29	0.27	9999.99
34AL	2	91	4	WET	490	335	0.44	0.33	16.37	0.66	9999.99
34AU	2	91	4	WET	489	334	0.22	0.54	16.73	0.76	9999.99
34BL	2	91	4	WET	492	337	0.30	0.46	17.12	0.66	9999.99
34BU	2	91	4	WET	491	336	0.22	0.49	17.42	0.76	9999.99

Raw Soil Sample Data

For Quarter 2/91

Site	Qtr	Yr	Mn	Sea.	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
35AL	2	91	4	WET	494	339	0.17	0.28	13.41	0.62	9999.99
35AU	2	91	4	WET	493	338	0.13	0.23	8.61	0.35	9999.99
35BL	2	91	4	WET	496	341	0.22	0.26	9.97	0.43	9999.99
35BU	2	91	4	WET	495	340	0.17	0.33	10.70	0.45	9999.99
36AL	2	91	4	WET	498	343	1.45	0.46	24.95	1.42	9999.99
36AU	2	91	4	WET	497	342	0.39	1.00	21.01	1.60	9999.99
36BL	2	91	4	WET	500	345	0.97	0.54	20.70	1.03	9999.99
36BU	2	91	4	WET	499	344	0.39	0.95	28.69	1.97	9999.99
37AL	2	91	4	WET	502	347	0.22	0.36	20.97	0.76	9999.99
37AU	2	91	4	WET	501	346	0.22	0.56	19.85	0.86	9999.99
37BL	2	91	4	WET	504	349	0.30	0.33	20.93	0.95	9999.99
37BU	2	91	4	WET	503	348	0.17	0.49	20.77	0.86	9999.99
38AL	2	91	4	WET	530	375	9.13	0.44	21.03	1.97	9999.99
38AU	2	91	4	WET	529	374	2.75	0.56	21.36	1.87	9999.99
38BL	2	91	4	WET	532	377	9.13	0.33	26.20	3.08	9999.99
38BU	2	91	4	WET	531	376	2.93	0.46	30.19	2.69	9999.99
39AL	2	91	4	WET	534	379	6.96	0.33	18.05	2.59	9999.99
39AU	2	91	4	WET	533	378	2.36	0.51	21.03	2.12	9999.99
39BL	2	91	4	WET	536	381	6.52	0.20	17.71	2.36	9999.99
39BU	2	91	4	WET	535	380	2.03	0.51	21.11	1.95	9999.99
40AL	2	91	4	WET	442	287	0.52	1.10	20.42	1.21	9999.99
40AU	2	91	4	WET	441	286	0.61	1.38	23.10	1.79	9999.99
40BL	2	91	4	WET	444	289	0.65	1.31	23.15	1.75	9999.99
40BU	2	91	4	WET	443	288	0.52	1.54	21.71	1.42	9999.99
41AL	2	91	4	WET	426	271	4.78	0.51	19.64	0.99	9999.99
41AU	2	91	4	WET	425	270	1.14	0.74	20.68	1.13	9999.99
41BL	2	91	4	WET	428	273	2.61	0.49	18.77	1.03	9999.99
41BU	2	91	4	WET	427	272	0.39	0.67	20.78	1.21	9999.99
42AL	2	91	4	WET	538	383	0.26	0.23	20.98	0.80	9999.99
42AU	2	91	4	WET	537	382	0.22	0.31	16.49	0.64	9999.99
42BL	2	91	4	WET	540	385	0.30	0.20	16.23	0.64	9999.99
42BU	2	91	4	WET	539	384	0.26	0.36	19.29	0.76	9999.99
43AL	2	91	4	WET	542	387	2.53	0.59	16.06	2.63	9999.99
43AU	2	91	4	WET	541	386	2.53	0.59	16.16	2.79	9999.99
43BL	2	91	4	WET	544	389	2.40	0.54	17.94	2.92	9999.99
43BU	2	91	4	WET	543	388	2.28	0.72	16.82	3.04	9999.99
44AL	2	91	4	WET	422	267	2.31	4.35	21.64	2.73	9999.99
44AU	2	91	4	WET	421	266	0.52	3.33	22.70	2.45	9999.99
44BL	2	91	4	WET	424	269	3.48	4.35	22.94	3.12	9999.99
44BU	2	91	4	WET	423	268	1.01	5.12	21.28	2.34	9999.99
45AL	2	91	4	WET	458	303	6.96	0.54	21.00	1.77	9999.99
45AU	2	91	4	WET	457	302	5.22	0.72	21.44	2.06	9999.99
45BL	2	91	4	WET	460	305	7.39	0.56	17.90	1.66	9999.99
45BU	2	91	4	WET	459	304	6.09	0.64	18.64	1.81	9999.99

Raw Soil Sample Data

For Quarter 3/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
01AL	3	91	7	DRY	566	536	2.60	1664	8.0	200	12	160	452	69.0	84	-4.8	0.22	145.00	1.67	1.00	1.58	12
01AU	3	91	7	DRY	565	535	2.80	1792	8.0	278	18	132	462	46.0	84	-4.8	0.25	190.00	1.47	1.00	1.58	20
01BL	3	91	7	DRY	568	538	1.10	704	8.2	58	4	92	144	60.0	71	-4.8	0.20	38.75	1.47	-2.50	1.90	8
01BU	3	91	7	DRY	567	537	0.52	333	8.4	45	4	38	48	44.0	144	-4.8	0.18	13.75	1.47	1.00	2.21	10
02AL	3	91	7	DRY	570	540	0.66	422	8.9	23	4	142	40	4.0	302	-4.8	0.70	6.25	1.25	1.67	2.53	10
02AU	3	91	7	DRY	569	539	0.40	256	8.6	30	5	38	20	-2.5	209	-4.8	0.25	4.38	0.54	1.67	3.79	26
02BL	3	91	7	DRY	572	542	1.70	1088	8.8	26	4	316	344	68.0	249	-4.8	0.42	26.25	2.58	2.50	3.48	18
02BU	3	91	7	DRY	571	541	0.52	333	8.6	35	6	68	46	-2.5	229	-4.8	0.33	5.00	2.25	3.33	4.11	32
03AL	3	91	7	DRY	550	520	6.40	4096	8.9	28	4	1260	1720	300.0	200	22.0	8.40	80.00	32.00	1.00	1.90	20
03AU	3	91	7	DRY	549	519	4.80	3072	9.0	26	3	880	1392	214.0	224	13.0	3.60	67.50	18.00	1.00	2.84	24
03BL	3	91	7	DRY	552	522	10.00	6400	8.7	72	11	1200	2688	700.0	195	-4.8	8.20	130.00	20.00	1.00	1.58	30
03BU	3	91	7	DRY	551	521	4.00	2560	8.9	24	3	520	1144	117.0	238	2.0	2.90	52.50	16.33	2.00	2.53	22
04AL	3	91	7	DRY	602	572	0.40	256	8.2	62	5	16	20	33.0	182	-4.8	0.46	5.00	0.58	2.00	0.63	16
04AU	3	91	7	DRY	601	571	0.36	230	8.2	57	5	16	16	-2.5	200	-4.8	0.86	4.38	0.65	1.00	1.26	18
04BL	3	91	7	DRY	604	574	0.28	179	8.2	59	4	10	16	-2.5	191	-4.8	0.29	3.13	0.50	3.00	0.95	12
04BU	3	91	7	DRY	603	573	0.32	205	8.2	56	4	10	16	-2.5	184	-4.8	0.35	3.25	0.38	3.00	1.26	12
05AL	3	91	7	DRY	594	564	0.76	486	8.7	20	2	160	44	-2.5	315	-4.8	6.20	10.00	1.62	2.00	2.84	14
05AU	3	91	7	DRY	593	563	0.44	282	8.4	29	3	55	20	7.0	251	-4.8	1.50	3.75	0.77	2.00	4.42	30
05BL	3	91	7	DRY	596	566	0.64	410	8.4	32	4	120	44	-2.5	320	-4.8	3.80	8.13	1.23	4.00	3.16	20
05BU	3	91	7	DRY	595	565	0.48	307	8.4	38	5	65	32	3.0	240	-4.8	2.50	5.00	1.08	2.00	3.79	28
06AL	3	91	7	DRY	590	560	0.32	205	8.4	25	2	38	20	-2.5	202	-4.8	0.28	4.13	0.58	4.00	2.21	2
06AU	3	91	7	DRY	589	559	0.34	218	8.4	26	2	38	20	-2.5	195	-4.8	0.28	3.75	0.54	4.00	2.21	4
06BL	3	91	7	DRY	592	562	0.32	205	8.3	34	3	24	16	-2.5	200	-4.8	0.23	3.63	0.50	1.00	1.26	4
06BU	3	91	7	DRY	591	561	0.30	192	8.3	34	3	26	16	-2.5	200	-4.8	0.25	3.63	0.38	4.00	1.90	6
07AL	3	91	7	DRY	702	668	0.40	256	8.7	57	6	58	16	-2.5	231	-4.8	1.80	2.50	0.94	5.75	2.84	10
07AU	3	91	7	DRY	701	667	0.40	256	8.6	64	8	54	14	-2.5	253	-4.8	0.72	2.50	0.53	5.00	3.48	16
07BL	3	91	7	DRY	704	670	0.44	282	8.6	64	8	58	24	-2.5	244	-4.8	1.15	3.38	0.63	5.00	2.53	10
07BU	3	91	7	DRY	703	669	0.52	333	8.7	62	7	78	24	-2.5	295	-4.8	1.00	2.75	0.81	6.50	4.42	22
08AL	3	91	7	DRY	618	588	3.40	2176	9.2	25	3	800	736	221.0	271	35.0	1.30	43.75	10.91	2.00	4.74	18
08AU	3	91	7	DRY	617	587	0.72	461	8.8	32	5	171	136	-2.5	202	4.0	0.86	8.75	0.64	2.00	3.79	26
08BL	3	91	7	DRY	620	590	2.20	1408	9.2	33	8	552	476	107.0	275	22.0	1.00	18.75	4.45	-2.50	3.48	18
08BU	3	91	7	DRY	619	589	0.72	461	9.0	22	4	171	94	3.0	262	15.0	0.68	6.25	1.64	1.00	3.16	16
09AL	3	91	7	DRY	574	544	0.56	358	8.5	38	7	66	40	-2.5	202	-4.8	0.29	10.63	0.75	3.33	3.16	32
09AU	3	91	7	DRY	573	543	0.40	256	8.6	31	6	34	20	-2.5	218	-4.8	0.26	4.38	0.83	3.33	4.74	40
09BL	3	91	7	DRY	576	546	0.60	384	8.7	28	6	87	64	-2.5	218	-4.8	0.24	6.88	1.50	2.50	2.21	52
09BU	3	91	7	DRY	575	545	0.40	256	8.5	39	6	36	12	-2.5	204	-4.8	0.25	4.63	0.58	2.50	2.84	26
10AL	3	91	7	DRY	562	532	0.32	205	8.6	31	3	38	23	-2.5	169	-4.8	0.56	3.50	1.47	-2.50	1.90	8
10AU	3	91	7	DRY	561	531	0.28	179	8.6	36	3	18	17	3.0	158	-4.8	0.44	3.63	0.67	1.00	2.53	10
10BL	3	91	7	DRY	564	534	0.44	282	8.7	29	3	68	48	33.0	173	-4.8	0.56	6.25	1.60	-2.50	1.26	8
10BU	3	91	7	DRY	563	533	0.28	179	8.6	40	4	12	14	-2.5	164	-4.8	0.44	3.00	1.47	2.00	2.53	14
11AL	3	91	7	DRY	622	592	1.80	1152	8.3	61	7	343	250	75.0	344	-4.8	7.00	31.25	2.91	3.00	2.21	51
11AU	3	91	7	DRY	621	591	1.50	960	8.4	45	5	291	196	140.0	275	-4.8	8.00	31.25	2.64	1.00	1.58	42
11BL	3	91	7	DRY	624	594	2.20	1408	8.3	73	8	457	424	233.0	249	-4.8	7.20	35.00	3.36	3.00	1.90	53
11BU	3	91	7	DRY	623	593	2.10	1344	8.4	58	6	457	358	217.0	315	-4.8	8.00	25.00	3.73	3.00	1.90	46

Raw Soil Sample Data

For Quarter 3/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
12AL	3	91	7	DRY	646	616	0.96	614	8.7	52	4	154	82	-2.5	271	-4.8	14.50	4.38	2.09	1.00	3.79	38
12AU	3	91	7	DRY	645	615	0.76	486	8.6	33	3	135	78	-2.5	264	-4.8	5.70	5.38	1.36	3.00	4.11	30
12BL	3	91	7	DRY	648	618	0.76	486	8.6	14	1	160	74	35.0	295	-4.8	15.50	3.75	1.82	2.00	3.16	38
12BU	3	91	7	DRY	647	617	0.72	461	8.7	31	2	145	82	7.0	242	-4.8	8.00	4.25	1.82	3.00	5.06	28
13AL	3	91	7	DRY	586	556	0.76	486	8.5	26	3	144	89	39.0	269	-4.8	11.00	4.38	0.50	0.83	1.90	24
13AU	3	91	7	DRY	585	555	0.88	563	8.8	33	11	168	75	-2.5	308	-4.8	9.80	5.63	1.00	3.33	2.84	18
13BL	3	91	7	DRY	588	558	0.92	589	8.5	21	3	152	91	26.0	251	-4.8	12.00	6.13	3.67	5.68	1.90	20
13BU	3	91	7	DRY	587	557	0.88	563	8.7	27	4	168	78	40.0	283	-4.8	8.60	6.25	0.33	7.73	2.53	16
14AL	3	91	7	DRY	558	528	1.80	1152	8.2	89	13	160	200	157.0	133	-4.8	0.30	80.00	1.67	2.00	3.48	76
14AU	3	91	7	DRY	557	527	1.50	960	8.4	73	12	98	164	85.0	169	-4.8	0.42	75.00	2.33	1.00	3.79	140
14BL	3	91	7	DRY	560	530	2.10	1344	8.1	108	16	160	232	141.0	155	-4.8	0.24	125.00	1.67	2.00	4.11	112
14BU	3	91	7	DRY	559	529	0.76	486	8.4	49	7	42	36	57.0	226	-4.8	0.27	31.25	2.20	2.00	4.42	103
15AL	3	91	7	DRY	630	600	0.32	205	8.2	63	5	16	10	10.0	164	-4.8	0.26	4.38	1.27	1.00	1.58	14
15AU	3	91	7	DRY	629	599	0.28	179	8.2	56	4	12	12	2.0	162	-4.8	0.22	3.75	0.36	3.00	1.90	18
15BL	3	91	7	DRY	632	602	0.30	192	8.3	58	5	16	8	-2.5	164	-4.8	0.38	3.75	0.45	2.00	1.90	20
15BU	3	91	7	DRY	631	601	0.32	205	8.3	57	5	14	10	-2.5	178	-4.8	0.20	3.13	0.36	4.00	3.48	26
16AL	3	91	7	DRY	554	524	7.60	4864	9.1	39	6	500	708	436.0	275	26.0	2.90	240.00	8.00	-2.50	2.53	69
16AU	3	91	7	DRY	553	523	3.20	2048	8.9	42	5	240	776	71.0	175	4.0	1.05	82.50	6.40	-2.50	6.32	82
16BL	3	91	7	DRY	556	526	9.00	5760	9.1	34	5	1360	2092	550.0	280	33.0	3.50	275.00	28.00	-2.50	3.48	78
16BU	3	91	7	DRY	555	525	5.60	3584	9.0	34	4	600	1400	130.0	178	15.0	0.92	150.00	17.67	-2.50	6.00	72
17AL	3	91	7	DRY	666	636	0.96	614	8.3	121	19	17	20	-2.5	306	-4.8	0.32	31.25	1.57	7.50	9.80	134
17AU	3	91	7	DRY	665	635	0.48	307	8.2	81	7	13	16	-2.5	253	-4.8	0.39	3.50	0.64	3.00	6.00	57
17BL	3	91	7	DRY	668	638	0.60	384	8.2	96	10	10	12	-2.5	235	-4.8	0.21	20.00	0.64	3.00	7.58	65
17BU	3	91	7	DRY	667	637	0.72	461	8.3	108	13	11	20	-2.5	275	-4.8	0.24	26.25	1.29	7.50	12.64	96
18AL	3	91	7	DRY	606	576	0.32	205	8.2	54	4	14	12	-2.5	193	-4.8	0.31	3.13	0.38	1.00	1.58	6
18AU	3	91	7	DRY	605	575	0.28	179	8.2	53	4	14	16	-2.5	195	-4.8	0.24	2.88	0.62	2.00	2.21	14
18BL	3	91	7	DRY	608	578	0.32	205	8.2	60	5	18	16	-2.5	204	-4.8	0.34	2.88	0.46	2.00	1.26	8
18BU	3	91	7	DRY	607	577	0.32	205	8.2	55	4	16	18	-2.5	209	-4.8	0.28	2.75	0.50	2.00	2.21	12
19AL	3	91	7	DRY	610	580	0.56	358	8.4	50	7	26	20	6.0	231	-4.8	0.32	14.38	1.36	5.58	2.53	93
19AU	3	91	7	DRY	609	579	0.56	358	8.2	70	9	28	22	-2.5	262	-4.8	0.23	15.63	0.73	8.46	4.74	69
19BL	3	91	7	DRY	612	582	0.84	538	8.7	47	7	97	32	58.0	311	2.0	0.44	17.50	2.73	1.00	4.11	116
19BU	3	91	7	DRY	611	581	0.48	307	8.3	52	6	30	10	-2.5	258	-4.8	0.29	8.13	1.36	5.00	5.06	70
20AL	3	91	7	DRY	614	584	0.50	320	9.0	25	5	122	20	-2.5	275	13.0	4.00	2.31	1.82	1.00	3.48	26
20AU	3	91	7	DRY	613	583	0.40	256	8.8	24	4	76	22	11.0	253	-4.8	1.85	3.00	1.45	1.00	4.42	40
20BL	3	91	7	DRY	616	586	0.68	435	9.2	26	6	187	28	-2.5	324	22.0	9.00	5.88	4.18	1.00	2.84	30
20BU	3	91	7	DRY	615	585	0.40	256	8.8	26	4	78	8	3.0	231	9.0	3.00	2.50	1.55	2.00	4.42	38
21AL	3	91	7	DRY	742	708	1.50	960	9.6	16	2	320	204	33.0	395	33.0	0.48	10.63	1.81	1.67	2.84	36
21AU	3	91	7	DRY	741	707	0.52	333	9.2	22	6	86	36	-2.5	209	20.0	0.36	3.75	0.75	3.33	3.16	26
21BL	3	91	7	DRY	744	710	0.96	614	9.4	16	3	198	128	17.0	306	17.0	0.52	5.00	1.69	2.50	1.58	16
21BU	3	91	7	DRY	743	709	0.32	205	9.0	24	6	62	24	3.0	213	-4.8	0.34	3.13	0.56	1.67	2.21	18
22AL	3	91	7	DRY	746	712	0.32	205	8.5	40	3	9	20	2.0	133	-4.8	0.31	2.88	1.88	2.50	1.26	8
22AU	3	91	7	DRY	745	711	0.28	179	8.5	41	3	5	16	-2.5	138	-4.8	0.30	3.13	0.56	1.67	1.90	8
22BL	3	91	7	DRY	748	714	0.32	205	8.5	41	3	9	20	-2.5	142	-4.8	0.29	3.25	0.28	0.83	0.95	4
22BU	3	91	7	DRY	747	713	0.24	154	8.5	44	3	5	12	18.0	124	-4.8	0.25	2.75	0.56	1.67	0.95	8

Raw Soil Sample Data

For Quarter 3/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
23AL	3	91	7	DRY	654	624	1.80	1152	8.5	62	6	400	220	359.0	377	-4.8	12.50	4.75	2.36	4.00	1.90	16
23AU	3	91	7	DRY	653	623	1.10	704	8.7	62	6	250	80	22.0	406	-4.8	13.50	4.38	1.54	3.00	1.90	6
23BL	3	91	7	DRY	656	626	1.10	704	8.7	50	6	250	76	86.0	377	-4.8	16.50	3.75	1.86	2.00	1.26	8
23BU	3	91	7	DRY	655	625	0.96	614	8.7	46	5	230	76	69.0	377	-4.8	13.00	3.00	1.86	3.00	1.58	6
24AL	3	91	7	DRY	626	596	1.20	768	8.5	47	6	221	108	74.0	213	-4.8	2.80	60.00	2.18	3.00	2.21	36
24AU	3	91	7	DRY	625	595	0.84	538	8.5	38	4	139	56	23.0	209	-4.8	2.10	32.50	2.45	1.00	3.16	38
24BL	3	91	7	DRY	628	598	1.20	768	8.5	43	5	238	130	115.0	200	-4.8	2.90	35.63	1.55	2.00	2.84	34
24BU	3	91	7	DRY	627	597	0.64	410	8.7	39	5	118	40	28.0	240	4.0	3.50	13.12	1.45	2.00	3.16	32
25AL	3	91	7	DRY	634	604	1.80	1152	7.9	163	29	184	154	364.0	180	-4.8	0.90	52.50	1.09	4.00	2.21	34
25AU	3	91	7	DRY	633	603	1.30	832	8.0	124	29	141	76	298.0	206	-4.8	0.80	32.50	1.00	4.00	2.21	40
25BL	3	91	7	DRY	636	606	1.00	640	8.0	89	15	120	58	184.0	218	-4.8	1.15	25.00	1.00	2.00	1.90	30
25BU	3	91	7	DRY	635	605	1.40	896	8.0	111	18	176	90	300.0	178	-4.8	1.10	38.75	1.45	1.00	1.90	34
26AL	3	91	7	DRY	698	664	0.24	154	8.6	64	4	12	16	-2.5	142	-4.8	0.28	2.31	0.50	4.00	0.95	2
26AU	3	91	7	DRY	697	663	0.20	128	8.6	68	4	8	16	-2.5	144	-4.8	0.23	2.19	0.31	2.00	0.95	6
26BL	3	91	7	DRY	700	666	0.24	154	8.6	69	4	12	16	-2.5	149	-4.8	0.21	2.06	0.38	3.00	0.63	2
26BU	3	91	7	DRY	699	665	0.24	154	8.6	67	4	10	16	-2.5	135	-4.8	0.22	2.75	0.38	4.00	0.95	4
27AL	3	91	7	DRY	598	568	1.20	768	9.2	17	2	300	105	35.0	370	41.0	15.00	16.88	4.00	1.00	1.90	8
27AU	3	91	7	DRY	597	567	0.52	333	8.9	23	3	133	16	-2.5	355	-4.8	3.50	5.00	1.46	1.00	4.42	22
27BL	3	91	7	DRY	600	570	1.40	896	9.1	19	3	320	200	-2.5	351	11.0	12.00	23.13	4.00	1.00	2.53	10
27BU	3	91	7	DRY	599	569	0.64	410	9.0	21	4	156	38	-2.5	342	9.0	6.00	5.63	2.00	-2.50	3.16	12
28AL	3	91	7	DRY	658	628	0.80	512	8.6	47	3	138	56	79.0	240	-4.8	0.92	13.12	1.07	3.00	1.58	8
28AU	3	91	7	DRY	657	627	0.52	333	8.7	45	5	109	20	-2.5	293	-4.8	1.80	3.63	0.93	2.00	1.90	12
28BL	3	91	7	DRY	660	630	0.80	512	8.6	46	3	148	52	47.0	231	9.0	1.10	20.63	1.00	4.00	2.53	8
28BU	3	91	7	DRY	659	629	0.56	358	8.6	45	4	105	20	58.0	275	-4.8	1.30	6.25	1.00	3.00	2.21	12
30AL	3	91	7	DRY	650	620	2.40	1536	8.3	76	9	448	352	331.0	280	-4.8	4.20	33.75	1.21	5.83	0.32	16
30AU	3	91	7	DRY	649	619	2.20	1408	8.3	81	10	419	324	231.0	302	-4.8	3.50	32.50	1.86	4.00	0.63	16
30BL	3	91	7	DRY	652	622	2.30	1472	8.3	57	8	429	344	215.0	271	-4.8	4.20	33.75	1.79	3.00	1.26	16
30BU	3	91	7	DRY	651	621	2.20	1408	8.3	74	9	419	312	292.0	264	-4.8	4.80	32.50	1.86	5.83	1.58	14
31AL	3	91	7	DRY	674	644	1.70	1088	9.0	49	3	343	224	130.0	293	-4.8	6.80	30.00	2.36	3.33	2.21	10
31AU	3	91	7	DRY	673	643	1.20	768	9.1	44	6	267	120	91.0	351	2.0	5.80	25.00	2.36	2.50	3.79	13
31BL	3	91	7	DRY	676	646	2.00	1280	9.0	41	3	480	312	217.0	271	-4.8	7.40	32.50	3.00	1.67	2.84	10
31BU	3	91	7	DRY	675	645	1.90	1216	9.0	46	3	450	276	235.0	278	-4.8	6.00	35.00	2.57	1.67	2.84	13
32AL	3	91	7	DRY	670	640	1.00	640	9.4	35	5	238	65	72.0	372	11.0	15.00	5.25	1.71	1.67	2.21	2
32AU	3	91	7	DRY	669	639	0.72	461	9.4	29	2	180	42	22.0	338	9.0	7.80	5.00	1.50	1.67	1.90	2
32BL	3	91	7	DRY	672	642	1.10	704	9.3	45	3	248	79	73.0	346	7.0	16.00	5.63	2.07	1.67	2.21	2
32BU	3	91	7	DRY	671	641	0.80	512	9.5	38	16	200	48	-2.5	439	16.0	7.40	4.63	1.86	3.33	2.53	6
33AL	3	91	7	DRY	714	680	0.18	115	8.9	54	4	11	12	-2.5	104	-4.8	0.17	2.63	0.28	5.00	6.00	12
33AU	3	91	7	DRY	713	679	0.18	115	8.8	55	4	5	16	-2.5	98	-4.8	0.20	2.88	0.34	3.75	6.32	10
33BL	3	91	7	DRY	716	682	0.18	115	8.9	56	5	7	14	2.0	99	-4.8	0.16	2.19	0.07	5.00	6.00	10
33BU	3	91	7	DRY	715	681	0.18	115	8.7	55	5	7	20	-2.5	100	-4.8	0.17	2.50	0.21	3.75	4.74	10
34AL	3	91	7	DRY	678	648	0.28	179	8.5	70	4	10	20	11.0	151	-4.8	0.46	2.88	0.57	1.67	0.63	2
34AU	3	91	7	DRY	677	647	0.24	154	8.4	69	4	8	20	-2.5	151	-4.8	0.78	3.63	0.50	1.67	0.95	6
34BL	3	91	7	DRY	680	650	0.28	179	8.4	69	4	12	20	-2.5	155	-4.8	0.35	2.44	0.43	2.50	0.63	4
34BU	3	91	7	DRY	679	649	0.28	179	8.3	75	5	6	12	-2.5	178	-4.8	0.28	3.38	0.39	0.83	0.95	6

Raw Soil Sample Data

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Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
35AL	3	91	7	DRY	682	652	0.18	115	8.6	52	3	4	14	-2.5	107	-4.8	0.26	1.56	0.36	1.67	0.63	6
35AU	3	91	7	DRY	681	651	0.20	128	8.3	60	3	4	14	-2.5	127	-4.8	0.24	1.88	0.29	1.67	2.84	8
35BL	3	91	7	DRY	684	654	0.20	128	8.4	55	3	4	12	16.0	115	-4.8	0.20	1.25	0.29	0.83	2.53	8
35BU	3	91	7	DRY	683	653	0.20	128	8.5	54	3	8	16	-2.5	107	-4.8	0.22	2.50	0.39	2.50	2.84	8
36AL	3	91	7	DRY	686	656	0.92	589	8.4	95	6	104	120	74.0	120	-4.8	0.34	28.75	1.14	1.67	0.95	10
36AU	3	91	7	DRY	685	655	0.32	205	8.5	64	4	24	32	-2.5	133	-4.8	0.22	3.88	0.32	1.67	0.63	8
36BL	3	91	7	DRY	688	658	0.40	256	8.7	45	3	72	16	48.0	187	-4.8	1.10	3.88	1.50	1.67	1.26	2
36BU	3	91	7	DRY	687	657	0.32	205	8.5	58	4	28	20	20.0	142	-4.8	0.25	5.00	0.64	0.83	1.26	6
37AL	3	91	7	DRY	690	660	0.32	205	8.3	85	4	8	20	-2.5	193	-4.8	0.21	2.63	0.41	6.50	0.95	4
37AU	3	91	7	DRY	689	659	0.24	154	8.5	75	4	6	16	-2.5	155	-4.8	0.24	2.50	0.31	3.00	1.26	6
37BL	3	91	7	DRY	692	662	0.24	154	8.6	72	3	10	16	-2.5	155	-4.8	0.24	2.44	0.38	2.00	0.63	4
37BU	3	91	7	DRY	691	661	0.24	154	8.6	71	4	6	16	-2.5	142	-4.8	0.22	1.88	0.34	4.00	0.32	4
38AL	3	91	7	DRY	734	700	1.60	1024	9.3	15	1	350	220	95.0	311	44.0	1.90	11.88	7.00	1.67	1.90	2
38AU	3	91	7	DRY	733	699	0.64	410	9.3	19	4	136	44	17.0	293	17.0	0.36	6.25	0.94	2.50	2.84	4
38BL	3	91	7	DRY	736	702	2.00	1280	9.3	16	1	400	306	175.0	306	39.0	2.60	15.00	9.50	1.67	2.53	2
38BU	3	91	7	DRY	735	701	0.68	435	9.3	18	4	160	42	-2.5	306	43.7	0.60	5.00	1.31	2.50	3.16	2
39AL	3	91	7	DRY	738	704	3.80	2432	8.4	86	14	720	952	280.0	124	-4.8	0.70	25.00	5.63	2.50	1.26	12
39AU	3	91	7	DRY	737	703	0.52	333	8.7	26	3	86	76	22.0	178	-4.8	0.50	5.63	1.13	2.50	1.90	8
39BL	3	91	7	DRY	740	706	1.40	896	9.0	21	2	280	278	70.0	169	17.0	0.39	11.56	2.06	2.50	1.26	4
39BU	3	91	7	DRY	739	705	1.10	704	8.6	36	3	187	242	33.0	149	-4.8	0.25	11.25	1.19	1.67	1.58	8
40AL	3	91	7	DRY	638	608	0.56	358	8.3	85	8	44	18	57.0	164	-4.8	0.29	25.00	1.36	2.00	3.79	20
40AU	3	91	7	DRY	637	607	0.48	307	8.2	62	6	59	8	3.0	231	-4.8	0.26	12.50	0.73	3.00	4.11	28
40BL	3	91	7	DRY	640	610	0.48	307	8.2	74	6	36	16	53.0	180	-4.8	0.17	14.38	0.64	1.00	3.16	26
40BU	3	91	7	DRY	639	609	0.48	307	8.2	73	5	34	8	44.0	222	-4.8	0.17	10.00	0.73	1.00	3.48	44
41AL	3	91	7	DRY	706	672	2.40	1536	8.6	74	5	460	588	156.0	151	-4.8	0.46	19.38	3.25	4.00	0.63	8
41AU	3	91	7	DRY	705	671	1.90	1216	8.5	58	6	270	456	96.0	129	-4.8	0.38	16.25	0.94	5.00	0.95	14
41BL	3	91	7	DRY	708	674	1.80	1152	8.9	51	3	310	392	122.0	195	-4.8	0.44	16.25	2.75	3.00	0.63	6
41BU	3	91	7	DRY	707	673	0.76	486	8.4	90	7	72	156	-2.5	129	-4.8	0.28	6.56	0.69	5.75	0.95	10
42AL	3	91	7	DRY	730	696	0.30	192	8.7	66	4	11	28	-2.5	160	-4.8	0.26	2.19	0.55	2.50	1.90	8
42AU	3	91	7	DRY	729	695	0.28	179	8.6	68	4	9	44	-2.5	160	-4.8	0.27	1.88	0.97	3.75	2.21	10
42BL	3	91	7	DRY	732	698	0.24	154	8.6	65	4	9	16	-2.5	160	-4.8	0.21	2.31	0.34	3.75	2.53	6
42BU	3	91	7	DRY	731	697	0.28	179	8.7	67	4	11	18	-2.5	164	-4.8	0.28	2.19	0.52	3.75	2.53	4
43AL	3	91	7	DRY	726	692	6.40	4096	8.6	227	66	1240	1008	2002.0	173	-4.8	0.74	5.00	10.00	6.50	2.53	42
43AU	3	91	7	DRY	725	691	2.40	1536	8.7	73	16	514	440	290.0	313	-4.8	1.05	3.75	4.97	6.50	7.90	16
43BL	3	91	7	DRY	728	694	9.00	5760	8.5	262	75	1676	1568	2183.0	187	-4.8	0.42	6.25	11.03	5.00	3.79	74
43BU	3	91	7	DRY	727	693	3.00	1920	8.7	97	21	460	564	520.0	289	-4.8	0.84	3.75	5.93	6.50	9.16	18
44AL	3	91	7	DRY	642	612	1.20	768	8.5	54	10	135	194	29.0	167	-4.8	0.16	37.50	0.73	3.00	3.79	136
44AU	3	91	7	DRY	641	611	0.44	282	8.4	42	6	26	12	-2.5	231	-4.8	0.14	3.75	0.91	2.00	4.11	82
44BL	3	91	7	DRY	644	614	3.00	1920	8.8	37	7	610	528	139.0	206	9.0	0.13	115.00	3.82	3.00	6.32	213
44BU	3	91	7	DRY	643	613	0.56	358	8.7	38	6	48	36	33.0	229	-4.8	0.12	8.13	0.91	2.00	6.95	99
45AL	3	91	7	DRY	662	632	1.10	704	9.1	34	3	250	32	-2.5	391	26.0	7.40	6.25	1.71	4.00	1.58	4
45AU	3	91	7	DRY	661	631	0.84	538	9.1	34	4	230	28	6.0	426	15.0	5.00	6.88	1.79	3.00	1.58	4
45BL	3	91	7	DRY	664	634	1.10	704	9.1	32	3	280	48	60.0	422	26.0	8.40	7.50	2.14	5.00	1.58	4
45BU	3	91	7	DRY	663	633	1.00	640	9.1	34	4	250	40	25.0	404	24.0	7.60	5.63	2.00	4.00	3.48	4

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
01AL	3	91	7	DRY	566	536	1.26	0.59	19.51	1.13	9999.99
01AU	3	91	7	DRY	565	535	0.96	0.71	16.25	1.01	9999.99
01BL	3	91	7	DRY	568	538	0.87	0.59	18.85	1.15	9999.99
01BU	3	91	7	DRY	567	537	0.48	0.83	14.83	1.01	9999.99
02AL	3	91	7	DRY	570	540	1.90	1.08	21.07	2.40	9999.99
02AU	3	91	7	DRY	569	539	0.50	1.51	18.86	2.12	9999.99
02BL	3	91	7	DRY	572	542	3.66	1.36	19.34	2.24	9999.99
02BU	3	91	7	DRY	571	541	0.82	1.76	16.67	1.97	9999.99
03AL	3	91	7	DRY	550	520	10.88	0.98	14.31	1.29	9999.99
03AU	3	91	7	DRY	549	519	9.13	1.10	15.74	1.23	9999.99
03BL	3	91	7	DRY	552	522	11.31	0.98	11.78	1.15	9999.99
03BU	3	91	7	DRY	551	521	7.83	1.08	21.42	1.71	9999.99
04AL	3	91	7	DRY	602	572	0.39	0.87	23.48	1.17	9999.99
04AU	3	91	7	DRY	601	571	0.26	1.07	20.10	1.07	9999.99
04BL	3	91	7	DRY	604	574	0.22	0.74	22.70	1.05	9999.99
04BU	3	91	7	DRY	603	573	0.22	0.77	24.75	1.19	9999.99
05AL	3	91	7	DRY	594	564	1.79	0.82	12.97	0.97	9999.99
05AU	3	91	7	DRY	593	563	0.61	1.05	13.56	1.13	9999.99
05BL	3	91	7	DRY	596	566	1.28	0.84	18.14	1.50	9999.99
05BU	3	91	7	DRY	595	565	0.78	1.07	15.96	1.40	9999.99
06AL	3	91	7	DRY	590	560	0.57	0.41	23.10	1.40	9999.99
06AU	3	91	7	DRY	589	559	0.48	0.59	21.07	1.19	9999.99
06BL	3	91	7	DRY	592	562	0.39	0.44	15.97	0.95	9999.99
06BU	3	91	7	DRY	591	561	0.44	0.56	19.15	0.80	9999.99
07AL	3	91	7	DRY	702	668	0.66	0.54	18.10	2.12	9999.99
07AU	3	91	7	DRY	701	667	0.62	0.72	16.63	2.06	9999.99
07BL	3	91	7	DRY	704	670	0.62	0.49	15.86	1.89	9999.99
07BU	3	91	7	DRY	703	669	0.79	0.87	14.41	1.77	9999.99
08AL	3	91	7	DRY	618	588	6.74	0.83	18.60	1.42	9999.99
08AU	3	91	7	DRY	617	587	1.22	0.88	20.72	1.52	9999.99
08BL	3	91	7	DRY	620	590	4.78	0.88	18.75	1.23	9999.99
08BU	3	91	7	DRY	619	589	1.82	0.98	20.33	1.58	9999.99
09AL	3	91	7	DRY	574	544	0.82	1.58	19.96	2.14	9999.99
09AU	3	91	7	DRY	573	543	0.50	1.73	20.43	2.28	9999.99
09BL	3	91	7	DRY	576	546	0.91	2.05	21.91	2.45	9999.99
09BU	3	91	7	DRY	575	545	0.50	1.51	18.21	1.91	9999.99
10AL	3	91	7	DRY	562	532	0.48	0.49	23.37	1.54	9999.99
10AU	3	91	7	DRY	561	531	0.30	0.49	23.30	1.62	9999.99
10BL	3	91	7	DRY	564	534	0.70	0.51	18.35	1.44	9999.99
10BU	3	91	7	DRY	563	533	0.26	0.59	22.47	1.66	9999.99
11AL	3	91	7	DRY	622	592	2.90	2.51	21.62	1.95	9999.99
11AU	3	91	7	DRY	621	591	2.65	2.36	23.38	2.06	9999.99
11BL	3	91	7	DRY	624	594	3.95	2.68	22.92	1.97	9999.99
11BU	3	91	7	DRY	623	593	3.95	2.68	23.83	2.06	9999.99

Raw Soil Sample Data

For Quarter 3/91

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
12AL	3	91	7	DRY	646	616	1.86	2.41	24.48	1.58	9999.99
12AU	3	91	7	DRY	645	615	1.78	2.00	24.51	1.46	9999.99
12BL	3	91	7	DRY	648	618	1.86	2.36	24.26	1.56	9999.99
12BU	3	91	7	DRY	647	617	1.82	1.87	23.93	1.38	9999.99
13AL	3	91	7	DRY	586	556	1.90	1.68	18.56	1.62	9999.99
13AU	3	91	7	DRY	585	555	2.33	1.43	17.86	1.38	9999.99
13BL	3	91	7	DRY	588	558	1.98	1.54	18.28	1.50	9999.99
13BU	3	91	7	DRY	587	557	2.17	1.38	19.16	1.40	9999.99
14AL	3	91	7	DRY	558	528	1.52	2.30	11.64	1.15	9999.99
14AU	3	91	7	DRY	557	527	0.83	3.07	20.36	2.34	9999.99
14BL	3	91	7	DRY	560	530	1.57	2.82	20.62	2.28	9999.99
14BU	3	91	7	DRY	559	529	0.52	2.56	20.01	2.28	9999.99
15AL	3	91	7	DRY	630	600	0.20	0.72	24.71	1.32	9999.99
15AU	3	91	7	DRY	629	599	0.28	0.90	24.91	1.27	9999.99
15BL	3	91	7	DRY	632	602	0.20	1.02	29.24	1.52	9999.99
15BU	3	91	7	DRY	631	601	0.20	1.05	27.22	1.40	9999.99
16AL	3	91	7	DRY	554	524	8.70	1.54	21.16	2.12	9999.99
16AU	3	91	7	DRY	553	523	3.48	1.40	8.77	0.62	9999.99
16BL	3	91	7	DRY	556	526	13.92	1.73	19.60	2.01	9999.99
16BU	3	91	7	DRY	555	525	6.96	1.46	19.30	1.36	9999.99
17AL	3	91	7	DRY	666	636	0.25	5.50	24.30	3.64	9999.99
17AU	3	91	7	DRY	665	635	0.17	2.71	24.28	2.20	9999.99
17BL	3	91	7	DRY	668	638	0.21	3.27	24.55	2.45	9999.99
17BU	3	91	7	DRY	667	637	0.21	3.41	23.02	2.79	9999.99
18AL	3	91	7	DRY	606	576	0.30	0.61	20.92	1.27	9999.99
18AU	3	91	7	DRY	605	575	0.26	0.90	24.58	1.40	9999.99
18BL	3	91	7	DRY	608	578	0.35	0.69	22.29	1.40	9999.99
18BU	3	91	7	DRY	607	577	0.30	0.84	22.50	1.34	9999.99
19AL	3	91	7	DRY	610	580	0.36	3.79	23.00	2.14	9999.99
19AU	3	91	7	DRY	609	579	0.36	2.41	19.25	1.58	9999.99
19BL	3	91	7	DRY	612	582	1.04	4.88	21.49	1.99	9999.99
19BU	3	91	7	DRY	611	581	0.36	2.51	19.91	1.54	9999.99
20AL	3	91	7	DRY	614	584	1.13	1.13	17.89	1.54	9999.99
20AU	3	91	7	DRY	613	583	0.79	1.43	18.63	1.64	9999.99
20BL	3	91	7	DRY	616	586	1.99	1.59	19.65	1.83	9999.99
20BU	3	91	7	DRY	615	585	0.75	1.31	17.86	1.48	9999.99
21AL	3	91	7	DRY	742	708	3.89	1.89	18.25	1.73	9999.99
21AU	3	91	7	DRY	741	707	1.12	1.41	19.45	2.10	9999.99
21BL	3	91	7	DRY	744	710	2.36	1.15	15.61	1.46	9999.99
21BU	3	91	7	DRY	743	709	0.83	1.05	20.21	1.87	9999.99
22AL	3	91	7	DRY	746	712	0.17	0.44	12.05	0.47	9999.99
22AU	3	91	7	DRY	745	711	0.17	0.41	20.15	0.78	9999.99
22BL	3	91	7	DRY	748	714	0.17	0.33	15.13	0.55	9999.99
22BU	3	91	7	DRY	747	713	0.13	0.38	19.45	0.72	9999.99

Raw Soil Sample Data

For Quarter 3/91

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
23AL	3	91	7	DRY	654	624	4.64	1.38	23.00	2.26	9999.99
23AU	3	91	7	DRY	653	623	4.31	1.15	24.41	2.16	9999.99
23BL	3	91	7	DRY	656	626	3.89	1.05	23.19	2.06	9999.99
23BU	3	91	7	DRY	655	625	3.09	0.93	23.08	1.91	9999.99
24AL	3	91	7	DRY	626	596	1.95	1.82	21.83	1.73	9999.99
24AU	3	91	7	DRY	625	595	1.30	1.77	22.49	1.73	9999.99
24BL	3	91	7	DRY	628	598	1.99	1.82	22.19	1.77	9999.99
24BU	3	91	7	DRY	627	597	1.39	2.20	18.23	1.40	9999.99
25AL	3	91	7	DRY	634	604	1.70	1.48	32.09	3.86	9999.99
25AU	3	91	7	DRY	633	603	1.37	1.54	31.76	3.99	9999.99
25BL	3	91	7	DRY	636	606	1.16	1.38	30.54	3.45	9999.99
25BU	3	91	7	DRY	635	605	1.62	1.51	30.64	3.35	9999.99
26AL	3	91	7	DRY	698	664	0.29	0.41	15.09	0.74	9999.99
26AU	3	91	7	DRY	697	663	0.21	0.51	21.63	1.09	9999.99
26BL	3	91	7	DRY	700	666	0.25	0.38	24.08	1.15	9999.99
26BU	3	91	7	DRY	699	665	0.25	0.51	20.72	1.01	9999.99
27AL	3	91	7	DRY	598	568	3.91	0.77	20.85	1.05	9999.99
27AU	3	91	7	DRY	597	567	1.57	1.19	15.62	0.97	9999.99
27BL	3	91	7	DRY	600	570	4.35	0.74	19.47	1.03	9999.99
27BU	3	91	7	DRY	599	569	2.27	0.87	19.69	1.13	9999.99
28AL	3	91	7	DRY	658	628	2.24	1.13	33.26	1.48	9999.99
28AU	3	91	7	DRY	657	627	1.70	1.25	33.71	1.60	9999.99
28BL	3	91	7	DRY	660	630	2.32	1.05	34.23	1.54	9999.99
28BU	3	91	7	DRY	659	629	1.74	1.31	34.18	1.69	9999.99
30AL	3	91	7	DRY	650	620	4.31	1.05	31.76	2.84	9999.99
30AU	3	91	7	DRY	649	619	4.23	1.02	30.46	2.84	9999.99
30BL	3	91	7	DRY	652	622	4.31	1.02	32.04	2.92	9999.99
30BU	3	91	7	DRY	651	621	4.23	1.02	31.21	2.65	9999.99
31AL	3	91	7	DRY	674	644	2.65	0.46	20.08	1.01	9999.99
31AU	3	91	7	DRY	673	643	2.31	0.64	19.10	1.05	9999.99
31BL	3	91	7	DRY	676	646	3.91	0.56	20.85	1.05	9999.99
31BU	3	91	7	DRY	675	645	3.15	0.56	19.46	1.01	9999.99
32AL	3	91	7	DRY	670	640	2.52	0.20	21.38	1.05	9999.99
32AU	3	91	7	DRY	669	639	1.96	0.24	20.23	1.09	9999.99
32BL	3	91	7	DRY	672	642	2.65	0.20	21.83	1.11	9999.99
32BU	3	91	7	DRY	671	641	1.96	0.24	20.41	1.07	9999.99
33AL	3	91	7	DRY	714	680	0.12	0.16	3.53	0.35	9999.99
33AU	3	91	7	DRY	713	679	0.16	0.19	3.64	0.70	9999.99
33BL	3	91	7	DRY	716	682	0.16	0.19	5.98	0.33	9999.99
33BU	3	91	7	DRY	715	681	0.16	0.16	5.61	0.35	9999.99
34AL	3	91	7	DRY	678	648	0.25	0.32	24.85	1.05	9999.99
34AU	3	91	7	DRY	677	647	0.17	0.46	24.26	1.11	9999.99
34BL	3	91	7	DRY	680	650	0.25	0.44	28.64	1.11	9999.99
34BU	3	91	7	DRY	679	649	0.17	0.49	28.04	1.15	9999.99

Raw Soil Sample Data

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
35AL	3	91	7	DRY	682	652	0.17	0.29	14.75	0.68	9999.99
35AU	3	91	7	DRY	681	651	0.12	0.32	12.90	0.53	9999.99
35BL	3	91	7	DRY	684	654	0.12	0.27	12.05	0.53	9999.99
35BU	3	91	7	DRY	683	653	0.21	0.32	12.61	0.55	9999.99
36AL	3	91	7	DRY	686	656	1.04	0.79	33.51	1.93	9999.99
36AU	3	91	7	DRY	685	655	0.41	1.10	33.66	2.30	9999.99
36BL	3	91	7	DRY	688	658	1.08	0.61	34.06	1.87	9999.99
36BU	3	91	7	DRY	687	657	0.41	1.00	34.51	2.24	9999.99
37AL	3	91	7	DRY	690	660	0.17	0.41	24.09	0.95	9999.99
37AU	3	91	7	DRY	689	659	0.17	0.51	28.82	1.07	9999.99
37BL	3	91	7	DRY	692	662	0.25	0.38	15.63	0.64	9999.99
37BU	3	91	7	DRY	691	661	0.21	0.46	15.17	0.64	9999.99
38AL	3	91	7	DRY	734	700	12.01	0.38	7.06	0.78	9999.99
38AU	3	91	7	DRY	733	699	4.14	0.54	5.08	0.51	9999.99
38BL	3	91	7	DRY	736	702	12.01	0.38	9.07	1.60	9999.99
38BU	3	91	7	DRY	735	701	4.35	0.49	16.29	2.63	9999.99
39AL	3	91	7	DRY	738	704	5.39	0.44	20.07	2.45	9999.99
39AU	3	91	7	DRY	737	703	1.04	0.61	24.86	2.14	9999.99
39BL	3	91	7	DRY	740	706	3.36	0.44	23.98	2.69	9999.99
39BU	3	91	7	DRY	739	705	1.86	0.61	21.63	1.95	9999.99
40AL	3	91	7	DRY	638	608	0.63	1.23	32.73	2.12	9999.99
40AU	3	91	7	DRY	637	607	0.67	1.46	31.16	2.26	9999.99
40BL	3	91	7	DRY	640	610	0.51	1.28	29.09	1.81	9999.99
40BU	3	91	7	DRY	639	609	0.44	1.69	30.04	1.54	9999.99
41AL	3	91	7	DRY	706	672	3.13	0.44	17.88	0.97	9999.99
41AU	3	91	7	DRY	705	671	2.24	0.67	21.68	1.38	9999.99
41BL	3	91	7	DRY	708	674	3.31	0.54	21.21	1.34	9999.99
41BU	3	91	7	DRY	707	673	0.70	0.59	20.37	1.25	9999.99
42AL	3	91	7	DRY	730	696	0.16	0.37	19.60	0.58	9999.99
42AU	3	91	7	DRY	729	695	0.20	0.42	18.19	0.70	9999.99
42BL	3	91	7	DRY	732	698	0.20	0.33	20.55	0.58	9999.99
42BU	3	91	7	DRY	731	697	0.20	0.26	18.91	0.80	9999.99
43AL	3	91	7	DRY	726	692	9.53	1.15	23.28	7.36	9999.99
43AU	3	91	7	DRY	725	691	4.39	0.92	19.46	3.99	9999.99
43BL	3	91	7	DRY	728	694	11.60	1.49	23.53	3.95	9999.99
43BU	3	91	7	DRY	727	693	7.18	0.90	14.30	3.53	9999.99
44AL	3	91	7	DRY	642	612	1.53	6.40	29.12	3.04	9999.99
44AU	3	91	7	DRY	641	611	0.47	4.48	24.41	2.40	9999.99
44BL	3	91	7	DRY	644	614	5.22	7.68	23.48	3.16	9999.99
44BU	3	91	7	DRY	643	613	0.63	4.61	24.54	2.65	9999.99
45AL	3	91	7	DRY	662	632	4.56	0.61	24.31	1.87	9999.99
45AU	3	91	7	DRY	661	631	4.31	0.63	24.29	1.81	9999.99
45BL	3	91	7	DRY	664	634	4.97	0.73	24.73	1.71	9999.99
45BU	3	91	7	DRY	663	633	4.47	0.73	23.60	1.69	9999.99

Raw Soil Sample Data

For Quarter 4/91

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
07AL	4	91	11	POST	818	1071	0.50	320	8.8	23	5	84	21	32.0	180	-4.8	3.10	8.13	1.03	2.00	3.24	10
07AU	4	91	11	POST	817	1070	0.52	333	8.7	32	7	60	18	-2.5	174	-4.8	1.70	16.88	1.03	2.00	5.18	22
07BL	4	91	11	POST	820	1073	0.72	461	8.8	22	4	122	64	27.0	156	-4.8	2.70	14.38	1.38	2.00	4.21	8
07BU	4	91	11	POST	819	1072	0.56	358	8.8	26	5	91	22	7.0	186	-4.8	2.20	16.88	1.14	3.00	5.83	20
11AL	4	91	11	POST	750	1003	1.50	960	8.8	28	3	286	180	117.0	271	-4.8	14.00	21.88	2.36	2.50	1.62	31
11AU	4	91	11	POST	749	1002	1.90	1216	8.4	51	6	314	256	183.0	222	-4.8	7.20	37.50	2.36	5.00	1.62	44
11BL	4	91	11	POST	752	1005	2.00	1280	8.8	29	3	381	320	184.0	256	-4.8	13.00	25.00	3.64	5.00	1.30	36
11BU	4	91	11	POST	751	1004	2.80	1792	8.5	49	6	505	520	217.0	200	-4.8	9.00	41.25	3.45	5.75	1.62	50
12AL	4	91	11	POST	770	1023	1.10	704	8.7	29	3	217	136	59.0	269	-4.8	12.00	7.19	1.85	5.63	2.92	34
12AU	4	91	11	POST	769	1022	1.50	960	8.7	39	3	269	220	92.0	202	-4.8	12.50	16.25	2.38	3.33	2.59	40
12BL	4	91	11	POST	772	1025	1.50	960	8.6	41	4	287	240	108.0	217	-4.8	11.50	14.38	1.92	5.63	2.92	42
12BU	4	91	11	POST	771	1024	1.10	704	8.7	35	3	217	132	59.0	282	-4.8	9.00	6.56	1.81	5.00	2.27	34
13AL	4	91	11	POST	774	1027	1.90	1216	8.3	57	9	400	388	186.0	152	-4.8	7.80	6.56	1.77	3.33	1.30	34
13AU	4	91	11	POST	773	1026	2.00	1280	8.4	66	8	400	350	262.0	185	-4.8	7.00	7.81	1.77	1.67	1.62	38
13BL	4	91	11	POST	776	1029	2.20	1408	8.3	72	10	419	420	200.0	135	-4.8	6.80	10.63	1.50	3.33	1.62	36
13BU	4	91	11	POST	775	1028	2.20	1408	8.4	57	8	438	408	215.0	174	-4.8	6.40	13.12	1.85	1.67	1.62	36
23AL	4	91	11	POST	758	1011	0.88	563	9.0	25	2	187	60	44.0	304	-4.8	20.00	5.63	2.73	5.00	2.59	7
23AU	4	91	11	POST	757	1010	0.80	512	9.0	14	2	187	60	-2.5	96	4.0	12.00	4.50	1.32	-2.50	2.59	7
23BL	4	91	11	POST	760	1013	0.86	550	9.0	17	2	190	72	32.0	317	-4.8	16.00	5.63	2.09	2.50	2.92	7
23BU	4	91	11	POST	759	1012	0.80	512	8.9	22	3	168	60	25.0	291	-4.8	12.00	5.75	1.77	5.00	2.59	9
24AL	4	91	11	POST	806	1059	1.50	960	8.8	30	5	312	110	133.0	159	-4.8	4.00	60.00	1.34	-2.50	0.65	22
24AU	4	91	11	POST	805	1058	1.20	768	8.8	29	4	244	124	56.0	156	-4.8	3.70	45.00	1.38	-2.50	0.97	32
24BL	4	91	11	POST	808	1061	1.50	960	8.7	33	5	309	164	104.0	152	-4.8	3.50	55.00	1.24	2.50	0.97	24
24BU	4	91	11	POST	807	1060	0.80	512	9.0	21	3	131	40	-2.5	195	-4.8	3.80	21.88	1.14	-2.50	2.27	24
25AL	4	91	11	POST	814	1067	1.80	1152	8.1	155	28	164	124	200.0	174	-4.8	1.40	62.50	1.17	5.75	3.24	42
25AU	4	91	11	POST	813	1066	1.80	1152	8.1	145	25	171	132	333.0	156	-4.8	1.70	62.50	1.03	5.75	2.27	38
25BL	4	91	11	POST	816	1069	1.20	768	8.2	90	17	107	74	244.0	182	-4.8	1.70	23.75	0.86	6.50	2.27	28
25BU	4	91	11	POST	815	1068	1.20	768	8.2	90	17	115	64	279.0	191	-4.8	1.60	21.25	1.03	9.50	2.59	34
28AL	4	91	11	POST	766	1019	0.80	512	8.9	17	2	150	60	53.0	215	-4.8	3.00	24.38	2.91	2.50	2.92	7
28AU	4	91	11	POST	765	1018	0.64	410	9.0	16	1	129	28	42.0	217	-4.8	2.50	18.13	1.27	2.50	2.92	11
28BL	4	91	11	POST	768	1021	0.88	563	8.8	24	2	179	64	78.0	195	-4.8	2.00	32.50	1.55	2.50	1.62	11
28BU	4	91	11	POST	767	1020	0.60	384	9.0	16	1	125	32	35.0	241	-4.8	2.20	14.38	1.64	2.50	1.94	13
30AL	4	91	11	POST	754	1007	2.10	1344	8.5	42	6	390	320	267.0	195	-4.8	5.40	33.75	3.64	-2.50	1.30	13
30AU	4	91	11	POST	753	1006	2.20	1408	8.5	43	7	410	340	283.0	200	-4.8	5.40	35.00	2.55	6.50	0.97	13
30BL	4	91	11	POST	756	1009	2.40	1536	8.5	48	8	457	424	250.0	174	-4.8	5.20	35.00	2.73	5.00	1.30	11
30BU	4	91	11	POST	755	1008	2.00	1280	8.4	47	7	410	340	250.0	195	-4.8	5.00	37.50	2.36	2.50	1.62	13
31AL	4	91	11	POST	798	1051	3.00	1920	9.1	20	2	457	488	455.0	169	-4.8	6.80	36.25	2.97	5.75	1.62	6
31AU	4	91	11	POST	797	1050	1.80	1152	9.4	16	2	460	216	169.0	253	-4.8	6.60	22.50	3.52	2.50	2.27	8
31BL	4	91	11	POST	800	1053	2.30	1472	9.2	17	2	590	336	329.0	174	-4.8	6.20	30.00	2.48	5.00	0.97	8
31BU	4	91	11	POST	799	1052	1.40	896	9.5	14	2	400	144	142.0	269	9.0	6.60	19.38	2.90	2.50	2.75	12
32AL	4	91	11	POST	802	1055	1.00	640	9.8	34	7	278	64	13.0	369	4.0	17.00	6.25	1.24	2.50	0.65	2
32AU	4	91	11	POST	801	1054	0.64	410	9.8	11	2	164	32	-2.5	330	9.0	5.00	4.88	1.48	2.50	1.94	4
32BL	4	91	11	POST	804	1057	0.94	602	9.7	9	2	263	56	-2.5	339	4.0	16.00	5.00	1.17	2.50	0.32	6
32BU	4	91	11	POST	803	1056	0.72	461	9.8	14	3	196	40	6.0	339	9.0	7.20	4.25	1.28	-2.50	0.65	2

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Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
43AL	4	91	11	POST	794	1047	2.20	1408	8.7	48	18	450	420	269.0	174	-4.8	1.70	5.50	2.03	5.75	1.94	8
43AU	4	91	11	POST	793	1046	1.40	896	8.8	33	10	257	196	175.0	248	-4.8	1.60	7.50	2.76	5.75	6.48	10
43BL	4	91	11	POST	796	1049	2.20	1408	8.7	49	18	450	430	281.0	174	-4.8	1.70	5.13	2.34	5.00	2.59	12
43BU	4	91	11	POST	795	1048	1.90	1216	8.6	47	16	390	342	221.0	204	-4.8	1.20	8.13	2.55	2.50	6.16	10
45AL	4	91	11	POST	762	1015	1.20	768	9.3	9	1	268	84	38.0	313	19.0	11.00	20.63	4.55	2.50	2.27	4
45AU	4	91	11	POST	761	1014	0.92	589	9.4	7	2	229	40	57.0	319	13.0	7.80	16.25	2.00	2.50	2.27	4
45BL	4	91	11	POST	764	1017	1.10	704	9.4	12	1	243	82	-2.5	302	19.0	12.00	18.75	1.77	2.50	2.27	4
45BU	4	91	11	POST	763	1016	0.92	589	9.4	6	1	217	52	27.0	300	17.0	7.40	16.25	3.36	2.50	2.27	2

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
07AL	4	91	11	POST	818	1071	1.12	0.37	31.89	2.88	9999.99
07AU	4	91	11	POST	817	1070	0.63	0.76	29.94	2.61	9999.99
07BL	4	91	11	POST	820	1073	1.37	0.47	21.74	2.53	9999.99
07BU	4	91	11	POST	819	1072	0.87	0.68	28.89	2.51	9999.99
11AL	4	91	11	POST	750	1003	3.74	2.56	51.37	4.03	9999.99
11AU	4	91	11	POST	749	1002	3.48	2.82	50.52	4.09	9999.99
11BL	4	91	11	POST	752	1005	4.78	2.61	46.98	3.72	9999.99
11BU	4	91	11	POST	751	1004	5.74	2.76	48.95	4.01	9999.99
12AL	4	91	11	POST	770	1023	2.17	2.05	23.39	1.29	9999.99
12AU	4	91	11	POST	769	1022	2.65	2.05	23.85	1.40	9999.99
12BL	4	91	11	POST	772	1025	2.69	2.02	24.11	1.38	9999.99
12BU	4	91	11	POST	771	1024	2.09	1.97	23.98	1.29	9999.99
13AL	4	91	11	POST	774	1027	2.57	1.54	20.72	2.06	9999.99
13AU	4	91	11	POST	773	1026	2.52	1.51	23.34	1.87	9999.99
13BL	4	91	11	POST	776	1029	2.57	1.43	23.09	1.91	9999.99
13BU	4	91	11	POST	775	1028	2.78	1.48	23.24	1.87	9999.99
23AL	4	91	11	POST	758	1011	4.00	1.31	25.30	2.28	9999.99
23AU	4	91	11	POST	757	1010	3.48	1.13	30.71	2.08	9999.99
23BL	4	91	11	POST	760	1013	3.74	1.18	29.64	2.10	9999.99
23BU	4	91	11	POST	759	1012	3.13	1.31	32.46	2.22	9999.99
24AL	4	91	11	POST	806	1059	2.52	1.64	23.03	1.99	9999.99
24AU	4	91	11	POST	805	1058	1.83	1.87	23.05	1.75	9999.99
24BL	4	91	11	POST	808	1061	2.70	1.74	24.63	2.01	9999.99
24BU	4	91	11	POST	807	1060	1.49	2.00	23.53	1.69	9999.99
25AL	4	91	11	POST	814	1067	1.49	1.46	31.54	3.19	9999.99
25AU	4	91	11	POST	813	1066	1.49	1.41	24.99	3.25	9999.99
25BL	4	91	11	POST	816	1069	1.24	1.34	33.83	3.31	9999.99
25BU	4	91	11	POST	815	1068	1.24	1.44	32.11	3.31	9999.99
28AL	4	91	11	POST	766	1019	2.83	1.25	61.94	2.94	9999.99
28AU	4	91	11	POST	765	1018	2.31	1.36	58.94	2.77	9999.99
28BL	4	91	11	POST	768	1021	2.78	1.43	29.12	1.83	9999.99
28BU	4	91	11	POST	767	1020	2.22	1.72	49.43	2.55	9999.99
30AL	4	91	11	POST	754	1007	4.52	1.02	51.35	5.03	9999.99
30AU	4	91	11	POST	753	1006	4.78	1.08	47.31	4.73	9999.99
30BL	4	91	11	POST	756	1009	4.96	0.95	31.29	2.84	9999.99
30BU	4	91	11	POST	755	1008	4.61	1.00	52.22	4.91	9999.99
31AL	4	91	11	POST	798	1051	4.44	0.38	20.77	0.86	9999.99
31AU	4	91	11	POST	797	1050	3.09	0.51	19.65	0.84	9999.99
31BL	4	91	11	POST	800	1053	3.57	0.51	20.82	0.99	9999.99
31BU	4	91	11	POST	799	1052	2.61	0.51	14.38	0.90	9999.99
32AL	4	91	11	POST	802	1055	2.61	0.18	21.03	0.90	9999.99
32AU	4	91	11	POST	801	1054	1.53	0.26	18.49	0.99	9999.99
32BL	4	91	11	POST	804	1057	2.17	0.18	20.95	0.97	9999.99
32BU	4	91	11	POST	803	1056	1.87	0.23	20.35	0.99	9999.99

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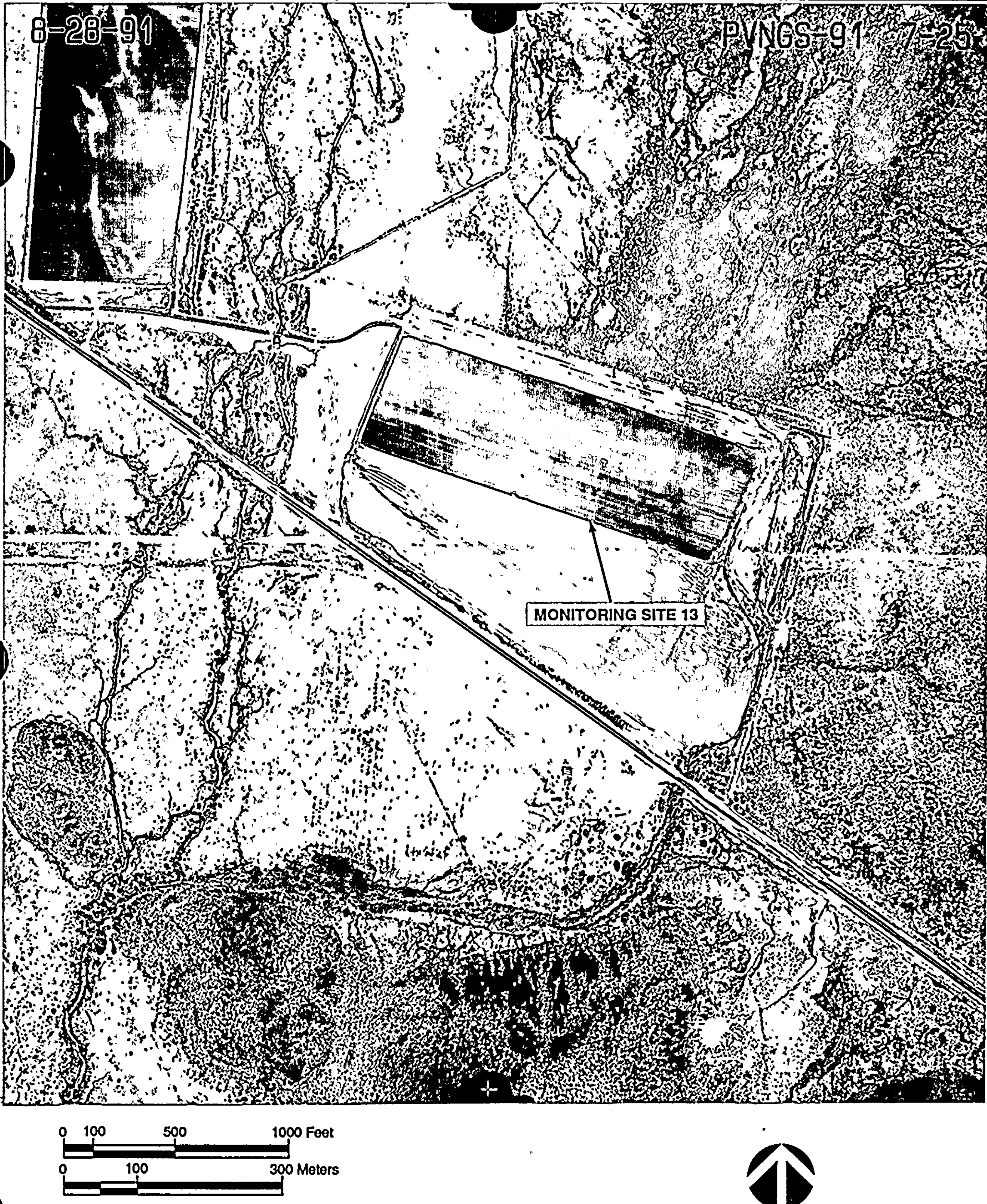
For Quarter 4/91

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
43AL	4	91	11	POST	794	1047	3.04	0.61	23.78	3.86	9999.99
43AU	4	91	11	POST	793	1046	2.48	0.77	23.70	4.27	9999.99
43BL	4	91	11	POST	796	1049	2.96	0.67	23.53	3.74	9999.99
43BU	4	91	11	POST	795	1048	3.04	0.77	24.78	4.38	9999.99
45AL	4	91	11	POST	762	1015	5.05	0.59	31.86	1.71	9999.99
45AU	4	91	11	POST	761	1014	4.44	0.64	31.41	1.79	9999.99
45BL	4	91	11	POST	764	1017	4.87	0.61	24.90	1.87	9999.99
45BU	4	91	11	POST	763	1016	4.26	0.61	47.01	2.98	9999.99

APPENDIX G

REMOTE SENSING

G-1. Color infrared imagery for monitoring site 12



G-2. Color infrared imagery for monitoring site 13